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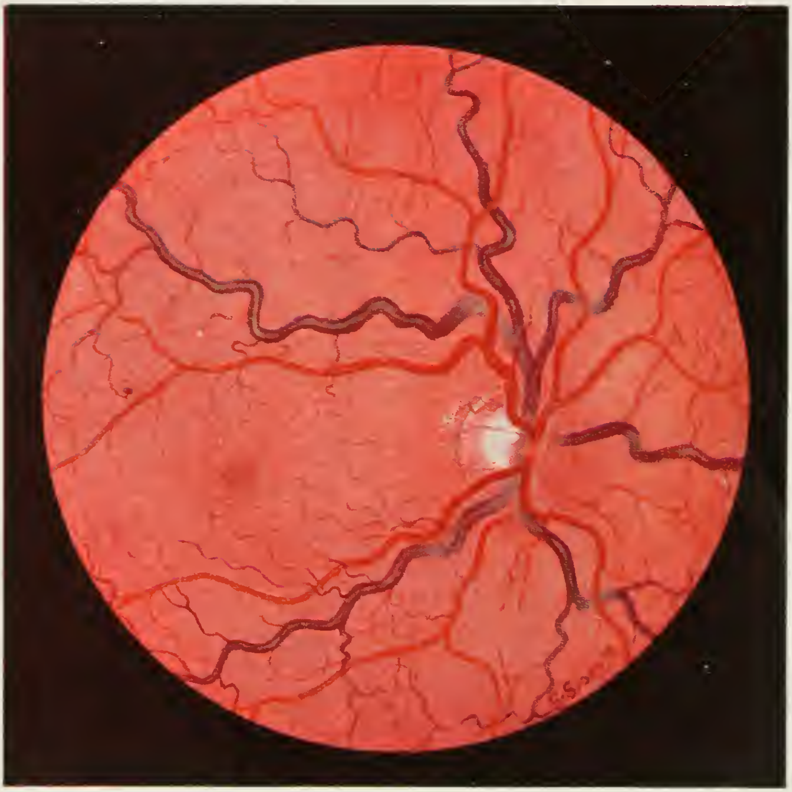

Chronic Cyanosis with Polycythæmia

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THE ANNALS
OF
OPHTHALMOLOGY

Vol. XX JANUARY, 1911 No. 1

ON SLOUGHING CORNEAE IN INFANTS: AN ACCOUNT BASED UPON THE RECORDS OF THIRTY-ONE CASES.*

Sydney Stephenson, D. O. (Oxon.),

London, England.

That the cornea may become gangrenous in babies suffering from inanition is a fact that must have struck attentive observers since the earliest dawn of scientific medicine.

The condition is tolerably common in several parts of the world. . Thus, in Berlin, A. von Graefe[1] spoke of seeing the disease almost every session and sometimes of meeting with three or four such cases in the course of a single month. Hirschberg,[2] again, declared that of the 7,000 new cases received at the Berlin *Klinik* every year, eight or nine were instances of keratomalacia. It is frequent, according to Thalberg,[3] in Russia, especially towards the termination of the great Lenten fast (end of March and beginning of April) and after the fortnight's fast in August. Nine of the thirteen cases reported by Thalberg were in children under three years of age, and of them 77.77 per cent were in sucklings. It prevails also among the half-starved negro children in South America, where it goes under the name "Ophthalmia

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*Anniversary lecture of the American Academy of Ophthalmology and Oto-Laryngology delivered at Cincinnati, Ohio, U. S. A., on September 19th, 1910.

Braziliana," bestowed upon it by Gama Lobo.[4] That author reported four fatal cases in children, in whom there likewise existed pronounced pulmonary and gastro-hepatic disturbances. Gama Lobo laid particular stress upon the lethargy exhibited by the patients, who would remain for hours together in any given position. Ullersperger,[5] who wrote in the same year as Gama Lobo, described four fatal cases in children of from eighteen months to five or six years of age. de Gouvea,[6] writing seventeen years later, confirmed and extended Gama Lobo's observations in Rio de Janeiro. He pointed out that night-blindness invariably preceded the other ocular symptoms, and he added some new signs of the Brazilian ophthalmia—as, for example, alopecia, pica, ulcerations over bony prominences, and yellowish *plaques* upon the skin, particularly of the face. The cause of the disease, in his opinion, was the almost exclusively farinaceous nature of the food given to the slaves on most of the Brazilian haciendas. "This, combined with severe work and lack of sleep," he remarked, "makes of the slaves veritable gold-producing machines."

Colonel H. Herbert[7] found epithelial xerosis to be so common among the poorer classes in Bombay, India, that he was able to collect one hundred consecutive cases in four months, June to September, 1896. In infants, as he pointed out, the cornea was liable to rapid suppurative destruction. According to M. Mori,[8] in Japan this peculiar disease of children is well known. It appears epidemically in that country during the months July to September, when diarrhoea is rife, and is known in the vernacular as "Hikan." The chief symptoms are diarrhoea, voracity, distension of the abdomen, wasting, dryness of the skin, night-blindness, and xerosis of the conjunctiva. In severe instances the hair loses its sheen and becomes dry; the cornea gets opaque and there is hypopyon and prolapse of the iris; and the case ends in complete disorganization of the eyeball. Colonel M. T. Yarr[9] tells us that keratomalacia is not uncommon in the tropics, especially in the native quarter of great towns, such as Calcutta, Bombay, and Hong Kong. The patients, who are mainly children, emaciate rapidly, suffer from diarrhoea, and frequently die.

A similar condition is found, although it is not common, in

England, where it affects babies whose nutrition is at a dangerously low ebb. The disease was described in 1827 by Joseph Brown,[10] of Sunderland, in a brief communication which bore the significant title of "*A case of ulcerated Cornea, from Inanition.*" He met with a case in a baby of six months, who had never had the breast-milk, and who was so much emaciated that the movements of the intestines were visible through the parieties of the abdomen. *Mackenzie[11] refers to the condition as one that he had repeatedly seen in infants emaciated from various causes, as chronic diarrhoea, cough following measles, hydrocephalus, and syphilis. Sir William Bowman[12] met with a case in a marasmic infant of thirteen months in whom both corneae sloughed, and the child died five days after she was first seen. W. T. Holmes Spicer[13] published an account of three cases in the year 1893. A year later, Tatham Thompson[14] narrated a fatal case in a baby of two months affected with acute jaundice, not of congenital origin. Two instances of keratomalacia, both apparently due to disseminated tuberculosis, were published by myself[15]—one in 1902 and the other in 1905. Arthur W. Ormond[16] reported a bilateral case in a wasted infant of ten months, affected also with xerotic patches on the conjunctiva. The patient was the youngest of fourteen children. Neither syphilis nor tubercle appeared to be present in Ormond's patient. Lastly, in 1907, I[17] published an account of four cases of infantile gangrene of the cornea, in scrapings from which the treponema pallidum was found.

As may be gathered from the scanty references given above, keratomalacia is far from common in England. But that is an entirely different thing from asserting its absence, as a recent writer, N. Bishop Harman,[18] has done. In the work referred to Harman makes the singular statement that severe forms of xerosis conjunctivae associated with keratomalacia apparently do not occur in England, except following the ophthalmia of newly-born children. As a matter of fact, under the conditions named by Harman the disease is rare.

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*The communications of Brown and Mackenzie effectually disprove the claim made by Adolf Knaebel (Ueber Keratomalacia infantum, Tübingen, 1901), namely, that the first cases of keratomalacia were published in the year 1846 by J. N. Fischer (Lehrbuch der gesammten Entzundungen und organischen Krankheiten des menschlichen Auges, 1846, S. 275). For that matter, Rau (v. Ammon's Monatsschrift, 1841), published two cases in children, aged 5 and 10 years respectively, five years before Fischer wrote.

To judge from the paucity of published cases (not always a safe thing to do), keratomalacia must be uncommon in the United States. So far as I know, the disease has been described from first-hand knowledge only by William S. Little[19] (1882), J. E. Weeks[20], [21] (1887 and 1901), Thomas C. Evans[22] (1898), J. M. Ray[23] (1898), and Charles W. Kollock[24] [25] [26] (1890, 1892, and 1894). Isolated examples were described by the first four writers, but Kollock's several communications were of more interest, since they showed that keratomalacia, associated with xerosis and pigmentation of the conjunctiva, was common among the young negro children of Charleston, the largest city of South Carolina, where more than one-half of the inhabitants are coloured. The disease was never seen among the whites. Kollock surmised that the food of the negroes, whose *menu*, according to the description he gave, consisted of "hominy (grits), rice, fish, and bad hog meat," had something to do with the condition. On the other hand, the whites were immune, he thought, because they did not eat so much fish, and "the quality of hog meat was better than that used by the negro, who will frequently buy strong smelling meat in preference to that which has no odour." In Kollock's experience, when the cornea broke down and suppurated, treatment availed little, and the patient soon died.

From what has been said it may be concluded, then, that a destructive form of keratitis, often associated with xerosis of the conjunctiva, may be met with in young children of low vitality, not only in Germany, Russia, Brazil, the East Indies, China, and Japan, but also in England and in some parts of America.

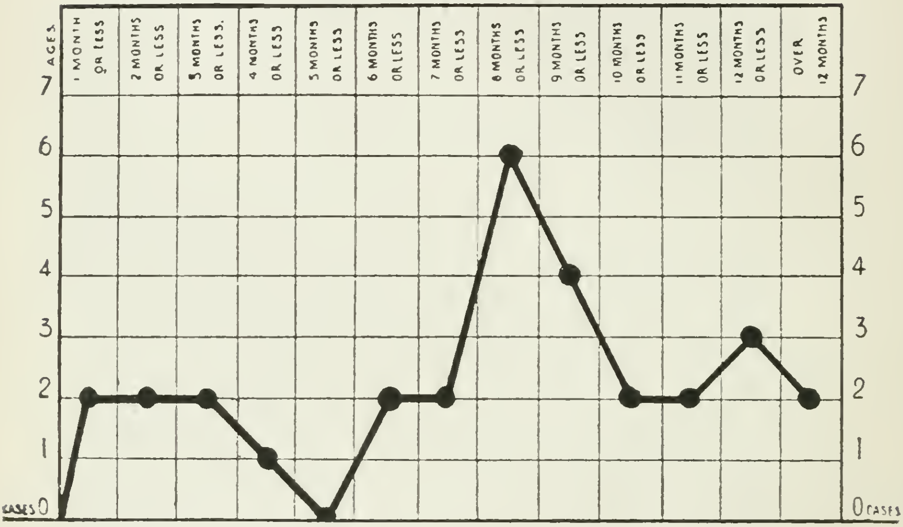
With two exceptions, the cases which form the basis of the present communication, thirty-one in number, were encountered at two London hospitals for children, *viz.*, the Evelina and the Queen's. The former furnished six cases and the latter twenty-three cases of keratomalacia. The relative size of the hospitals has doubtless something to do with the different number of cases seen at the two places. There is, however, another factor—the difference in the figures is correlated with a difference in the class of child attending the two institutions. · Thus, the Evelina draws its clients mainly from the rural, semi-rural, and suburban districts south of the river Thames, whereas the Queen's derives 85 per cent. of its patients from densely populated and poverty stricken districts in the east end of London, where indigence, dirt, ignorance, vice, and alien immigration jostle one another at every corner.

As babies suffering from keratomalacia are always ill (often dangerously so), it can be readily understood that they are usually kept at home, or if taken to a hospital, an ophthalmic hospital is not the most likely place where advice would be sought. Hence, it is at a large children's hospital in the poorest part of a great city like London that such cases are likely to be met with, if anywhere.

Among 7,000 patients Hirschberg saw 8 or 9 cases of the disease (1 in 875 or 1 in 777); among 28,000 patients Leber met with 4 cases of the disease (1 in 7000); among 30,000 patients Braunschweig[27] saw 16 cases (1 in 1,875); among 34,000 patients Kuthe[28] met with 26 (1 in 1,307); and, finally, among 16,600 patients Peltesohn[29] found 3 cases (1 in 5,533).

From the figures at my disposal, I estimate that keratomalacia is encountered in one per thousand of the eye cases attending a children's hospital in the poorer part of London.

Keratomalacia, in my experience, is a disease of children whose ages range from one month to twenty months. It is as rare above as it is below those limits. The oldest patient seen by A. von Arlt,[29] who described the disease as long ago as 1850, was fourteen months of age. It is of some importance to note that during the first few weeks of life—that is to say, when ophthalmia neonatorum is rife—keratomalacia is uncommon. At the same time case No. 11 in my present series occurred in a premature baby admitted on the seventh day of extra-uterine life. The baby, although kept in an incubator, succumbed, after an illness lasting twenty-seven days, from a cause that was never satisfactorily explained despite a *post-mortem* examination. The baby may possibly have died from a general streptococcal infection, such as is believed by Kassowitz and Hochsinger[30a] to occur in syphilitic infants. The ages of my other patients have ranged from one month to twenty months, seventeen of the total number (*i.e.,* about one-half) having occurred between the eighth and twelfth months of life. The average was 4.54 months. In face of these facts it becomes a little difficult to understand on what grounds Valude[31] makes the statement that the affection ordinarily begins in the first few weeks of life and is not met with after ten months. It may be noted in passing that in Knaebel's[32] series of eighteen cases of keratomalacia the youngest patient was aged three weeks and the oldest six months. The average was 11.16 weeks.



The age distribution in London of Thirty Cases of Keratomalacia.

Personally, I have never seen an instance of keratomalacia except in the children of the poor.

As regards sex, Knaebel's figures[32] seemed to show that keratomalacia was much commoner in males than in females. Of his eighteen cases, 83 per cent. (15) were in males and 17 per cent. (3) in females. Thalberg's figures, again, give males 6 (66 per cent.) and females 3 (33 per cent.). On the other hand, Braunschweig's figures[27] dealing with 16 cases, gave males 5 (31.65 per cent.) and females 11 (68.75 per cent.). My own cases indicate no such disproportion between the sexes, which is probably merely fortuitous. Of my thirty-one cases, 13 (41 per cent.) were in males, 17 (54 per cent.) in females, and in one (3 per cent.) the sex was not noted.

von Graefe, as well known, attributed keratomalacia in infants to encephalitis, and Hirschberg adopted a similar view. The changes supposed to be characteristic of encephalitis were found by Professor Klebs in two of von Graefe's patients, aged three and four months respectively. The three cases described by Hirschberg showed, after death, similar changes. Bezold[33] found a degeneration of the glial cells of the brain in an infant, aged one month, who developed keratomalacia after measles. In reporting a fatal case in a female infant of ten weeks suffeing from "spasms" and diarrhoea, William S. Little[19] spoke of keratomalacia as "symptomatic of a brain lesion, with a neuro-paralytic condition of the fifth nerve distributed to the cornea." He describes the condition as preceded by convulsions or loss of consciousness, and speaks of all cases being associated with a brain lesion of severe character, central in position and rapid in progress. In 1883, Jacqusiel[34] presented sections from the brain of such a case with the idea of supporting v. Graefe's theory of causation; but more than one member of the Berlin Medical Society, after examining the specimens, expressed his doubts as to their pathological nature.

It may be asked why v. Graefe's view, apparently so well grounded on the work of competent pathologists, has found but little support of late years. The reason is simple, namely, that the diffuse infantile encephalitis of Virchow is nowadays regarded as non-existent. Certainly, with rare exceptions, as in Weeks' case and in one of my own, the clinical symptoms do not point in the direction of a cerebral affection, a fact insisted upon by v. Graefe and by Hirschberg themselves. The only kinds of infantile encephalitis recognised at the present time are such as may occur locally in association with meningitis or with syphilitic arteritis or with thrombosis secondary to an infective disease, such as measles.

Jastrowitz[35] examined the brains of 65 infants who had died from various causes, and found the changes supposed to point to encephalitis present in all save one. Indeed, the existence of an encephalitis recognisable only with the microscope, such as that thought to exist in v. Graefe's and the other cases, must, in the light of modern pathological knowledge, be regarded as something more than merely doubtful. In brief, we are compelled from the evidence before us to conclude with Max Knies[36] that the granulo-fatty corpuscles, once looked upon as characteristic pathologically of encephalitis, are now known to occur in the brain of all little children.

Writing in the year 1877 Förster[37] laid considerable stress upon diarrhoea as a cause of keratomalacia in infants during the first six months of life.

W. T. Holmes Spicer,[13] who reported three cases of keratomalacia in the year 1893, concluded that the malady affected "starving or hand-reared infants brought up on starch foods without milk, and with absence of nitrogenous elements and fat." This statement seems to me to amount to little more than a very fair description of the food usually given by ignorant mothers to very poor babies in London. Whether it is enough to account for sloughing of the cornea, I will not undertake to say. But of one thing I feel tolerably certain, namely, that if it be, then keratomalacia should be much commoner in London than appears to be the case.

J. Tatham Thompson[14] considered acute jaundice to be one of the causes of keratomalacia.

In 1883, Leber[38] described a case that seemed likely to throw a new light upon the aetiology of keratomalacia. A baby, aged four months, suffering from that ailment, died from broncho-pneumonia. After death, cocci and bacilli, similar to those found in the eye during life, were discovered in the calices of the kidneys, along with a desquamating epithelial affection analogous to xerosis of the conjunctiva. In this connection, however, the fact may be mentioned that in ordinary idiopathic marasmus the kidneys, according to Koplik,[39] may be the seat of parenchymatous degeneration.

In the following year (1884) Schulz[40] published a case confirmatory of Leber's observations. Schulz found cocci and bacilli, the exact nature of which he did not determine, in the conjunctiva, lungs, and kidneys of a baby of five months, who died from keratomalacia and broncho-pneumonia, after an illness which lasted for about twenty days. The value of the observation, however, is somewhat lessened by the fact that the autopsy was not made until fifty-two hours after death.

In 1888, Leber and Wagenmann[41] described a case which suggested that keratomalacia may be the outward and visible sign of a generalised bacterial invasion. A male baby, aged ten days, manifested necrosis of the ocular conjunctiva around the cornea of the right eye, which itself remained almost free from opacity. The left eye showed no changes. Syphilis was not present. The child died a few hours after he was first seen. The autopsy, undertaken by Professor Orth, eleven hours after death, failed to reveal any cause adequate for death, and, in particular, there was no evidence of encephalitis. Bacteriological investigation, however, brought to light the fact that a multiple streptococcal invasion existed. Streptococcal chains were found in the vessels of the tissues of the eye, as well as in the other organs examined, *viz.,* the kidneys, the suprarenal bodies, and the skin. By Leber and Wagenmann this bacterial invasion was believed to be responsible both for the ocular affection and for the lethal issue of the case. It is, nevertheless, to be noted that the baby had an affection of one external ear, presenting a close resemblance to gangrenous dermatitis, a disease known to occur in marasmus, and to be usually associated with the streptococcus pyogenes (L. E. Holt). Is it not possible that the generalised streptococcal invasion was connected more closely with the ear than with the eye trouble?

Bahr and Garnier[42] made an autopsy upon a case of ulceration of the cornea in an infant of fourteen months, and found the immediate cause of death to be purulent meningitis and bronchitis. Masses of streptococci were present in the vascular tissues of the eyeball, and the same micro-organism was cultivated from the sanious pus of the subdural space. The authors explained their case by supposing that the streptococci, after perforating the cornea, had gained access to the circulation, had by that means infected various parts of the body, and by their localisation in the brain had caused the death of the patient.

An important case by J. E. Weeks,[21] of New York, bears upon the possibility of endogenous infection as the cause of keratomalacia. An emaciated and bottle-fed baby, *aetat* eight months, suffered from xerosis of the conjunctiva, together with ulceration of the corneae. Death from exhaustion after a stay of eleven days in the New York Eye and Ear Infirmary. The autopsy showed a fatty liver and enlarged spleen and kidneys. The pelvis of the right kidney was filled with flocculent pus, while its lining mucous membrane was coated with a frothy, whitish exudate, resembling to some degree the secretion on the conjunctiva observed during life. Bacteriological examination showed that the xerosis bacillus was present in conjunctiva, pelvis of the kidney, liver, spleen, and pancreas.

Although it appears to be supported by some of the cases mentioned above, yet the theory of endogenous infection may, in my opinion, be put on one side without hesitation. The experiences of Baumgarten and of Braunschweig[27] prove that, as a rule, micro-organisms can be grown neither from the blood during life, nor from the viscera after death, of children affected with keratomalacia. All available evidence, indeed, goes to show that the determining cause of the corneal ulceration is to be found in exogenous infection with this or that pyogenic micro-organism, while its predisposing cause is the lowered vitality of the patient. The predisposing cause would probably be inadequate without the exciting cause, and *vice versa.*

Keratomalacia, then, in my view, is not to be regarded as the mere local manifestation of a generalized infection, as suggested by the cases of Leber, Schulz, Weeks, and some others.

It is significant that keratomalacia hardly ever occurs in breast-fed babies, unless, as in Russia, the mother's health has become impaired by long fasting, a thing scarcely likely to happen either in America or England. This point is well brought out by Knaebel's figures,[32] according to which only three of eighteen children with keratomalacia had been nursed by their mothers, and the rest, fifteen in number, had been reared on various kinds of artificial food. My own figures tell the same tale and point the same moral. Of my thirty-one cases, two, or 6.46 per cent., were entirely breast-fed; twelve, or 38.71 per cent., were fed exclusively upon artificial food; and seventeen, or 54.83 per cent., were reared partly upon breast milk and partly upon artificial food.

Two important points brought into relief by Knaebel[32] are that: (1) keratomalacia is disproportionately frequent in twin children, and (2) illegitimate are more apt to be affected than legitimate offspring.*

Without exception, the victims of keratomalacia are marasmic—"little wasters," in the pitifully expressive slang of a children's hospital.

The marasmus may be either symptomatic or idiopathic. The causes of the former include tuberculosis, syphilis and imperfect dieting, with its sequels in the shape of chronic diarrhoea and vomiting, the familiar "D. and V." of a children's hospital. It is, however, to the idiopathic group that the name "marasmus" or "athrepsia" may more properly be applied. In such cases, as well known, neither examination during life nor dissection after death enables us to ascertain the cause of the mal-assimiliation, which may possibly be due, as some have supposed, to microscopical changes in the glands and other appendages of the alimentary tract. It is, as L. E. Holt has well said, "a vice of nutrition only."

In London, keratomalacia has a distinct seasonal incidence, due to the fact that "D. and V." ("xymotic diarrhoea" in more technical terms) is more or less epidemic in that city during the months of June, July, and the early part of August. Thus, of thirty cases of keratomalacia, about three-quarters (73.33 per cent.) appeared in the six warm months, May to October, and only about one-quarter (26.66 per cent.) during the six colder months, November to April. No cases were met with in January and April. For some unexplained reason, however, March proved an exception to the rule, since no fewer than four cases of keratomalacia came under notice during that month.

The connection between keratomalacia, on the one hand, and the disease variously known as "epidemic enteritis," "zymotic enteritis," "ileo-colitis," or "epidemic diarrhoea," on the other, may be brought out in another way, namely, by contrasting graphically the seasonal curve of the two ailments. This has been done in the accompanying diagrams, an inspection of which shows that June, July, August and September represent the greatest mortality from epidemic diarrhoea and the greatest incidence of keratomalacia.

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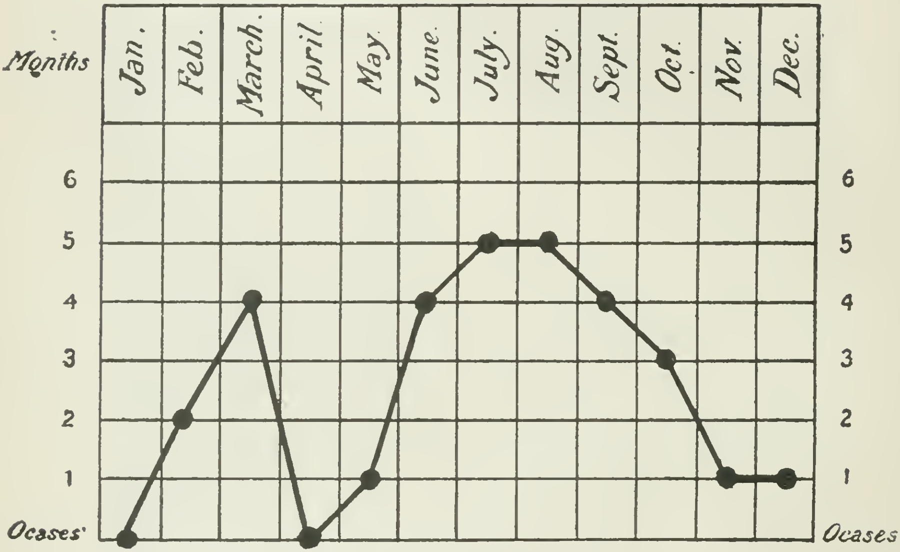
*Of Knaebel's eighteen cases of keratomalacia five were in twins: fifteen were legitimate and three illegitimate children.

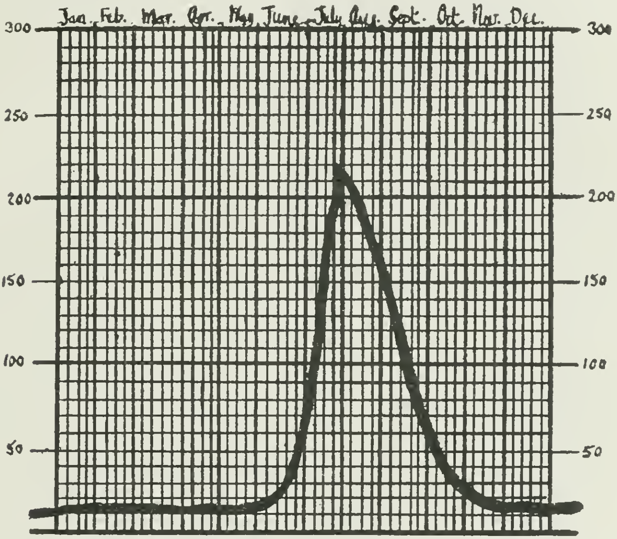
Diarrhoea, like keratomalacia, falls during September and October, and with the exception noted above, scarcely exists during the remaining months of the year.

If we distribute thirty of the cases of keratomalacia among the four quarters of the calendar year, we shall find that the malady was most prevalent in the third quarter, next prevalent in the first quarter, and was equally prevalent in the second and fourth quarters. If this be compared with the prevalence of zymotic diarrhoea distributed in the same way, the close correspondence in the highest seasonal variation of the two maladies will be at once apparent. It might be closer still were not my figures dealing with keratomalacia necessarily so restricted.



The Seasonal Distribution in London of Thirty Cases of Keratomalacia.

The syphilitic origin of keratomalacia has been insisted on by several writers, among whom may be mentioned Horner (1882), Biber (1890), Zirm (1895), Peltesohn (1898), Evans (1898), Krausse (1899), Valude (1905), and Terrien (1905). Horner[44] met with cases of keratomalacia which recovered, and which later developed true interstitial keratitis. He also saw in the same family an infant suffering from keratomalacia succumb to athrepsia, while a brother presented the classical signs of Hutchinson's interstitial keratitis. Terrien,[45, 46] indeed, does not hesitate to claim that hereditary syphilis constitutes the chief factor in the production of keratomalacia, although he adduces no formal proof of this somewhat sweeping statement. Wicherkiewicz[47] goes even further, and, if I understand him aright, denies the ability of any factor, other than hereditary syphilis, to cause the disease. The discovery by myself[17] of the spirochaeta pallida in scrapings from the cornea constitutes the experimental proof (if such were needed) of the reality of syphilis



The Seasonal Incidence of Deaths from Diarrhoea in London (50 years, 1840-1890).*

Quarter.	Zymotic diarrhoea[43] (15,478)	Keratomalacia (30).
First	8.7	20.00
Second	16.8	16.67
Third	60.7	46.66
Fourth	13.8	16.67

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*From "The Elements of Vital Statistics." By Arthur Newsholme, 1899 as a factor in the causation in certain cases of keratomalacia.

A glance at the curve representing the age incidence of my thirty cases of keratomalacia, shows a rise extending from the first to the third month, followed by a fall, after which the incidence of the disease becomes greater, until it reaches its maximum in the eighth month. The initial rise appears to be accounted for by the fact that the manifestations of congenital syphilis as shown in a well-known monograph by the late George Carpenter,[48] of London, reach their highest point in the second month of life, and then slowly decline until after the ninth month, when they may be said to be practically non-existent. It is interesting to observe that even in a small series of cases such as mine, the influence of syphilis is able to imprint itself in so definite a manner upon the age incidence of keratomalacia.

Finally, it may be added, that of my 31 cases of keratomalacia, syphilis was diagnosed clinically in seven cases, or 22.58 per cent.

Tuberculosis existed in six (19.36 per cent.) of my thirty-one cases of keratomalacia, the diagnosis being made during life in three, and after death in three of the children. It is to be noted that of the twelve fatal cases, tubercle was present in 25 per cent. The disease was of the generalised type, as usual in children of so tender an age, with pulmonary or meningeal manifestations. The figures are small, but so far as they go they indicate that tuberculosis is an important cause of keratomalacia in infants. I will not now stay to enquire whether the tuberculosis was primary, or merely grafted, so to speak, on a pre-existing malady, nutritional or otherwise. It is of more importance to remember that at such an early age there are many points of resemblance between marasmus, on the one hand, and tuberculosis, on the other. Progressive wasting, pallor, and loss of strength are features common to both affections. Many a case assumed to be one of marasmus has been found upon the dissecting-room table to be one of tuberculosis.

Much as in Russia, where, as already said, keratomalacia is commonest towards the end of the great religious fasts, so in London its greatest prevalence coincides with, or closely follows, the season when zymotic diarrhoea is most frequent A similar sort of thing, according to Mori, is observed in

Japan also. Of my cases, 9 (or 29.03 per cent.) were due to zymotic diarrhoea.

As for marasmus, pure and simple, that accounted for 7 (or 22.58 per cent.) of my thirty-one cases.

Finally, in two of the cases (6.45 per cent.) the cause of the corneal mischief remained obscure.

A clue to the cause of the corneal gangrene is sometimes given by the age of the child. Thus, the most likely factors during the first two or three months of life, are prematurity, twin births, congenital syphilis, and infantile atrophy. Later cases are more commonly the result of zymotic diarrhoea, tuberculosis, or of insufficient or unsuitable food.

But when all is said and done, we shall not err greatly if we assume that destruction of the cornea may supervene, other things being favourable, in any baby whose nutrition is seriously impaired, whether as the result of disease, semi-starvation, or, for that matter, from any cause whatsoever.

Some systematic writers have spoken of the disease as though a fatal termination was inevitable. Hirschberg[2] was especially emphatic with regard to this point. "Notwithstanding the relatively mild symptoms present at the onset," he wrote, "the outcome of the disease is absolutely lethal." Knaebel (*loco citato*,[32] p. 6) spoke of keratomalacia "as nearly always a harbinger of impending death." Again, the statement made by Koun[51] (*loco citato*, p. 31) that "the appearance of keratomalacia is a sign of the impending dissolution of the little patient" is true only approximately.

That the underlying disease often ends fatally is unquestioned. A glance at any series of figures dealing with keratomalacia will at once show the truth of this statement. For example, of the eighteen cases reported by Knaebel,[32] nine, or exactly one-half, died before they had reached the age of six months, two in the *Klinik* and seven at home. Death occurred in Braunschweig's[27] five cases—three in hospital, and two 12 and 25 days respectively after discharge from the Halle *Augenklinik*. In my own series of thirty-one cases the mortality amounted to thirteen, or 41.93 per cent. This number, however, is probably below the mark, inasmuch as some of my patients may have died soon after they passed from under my personal observation. Few can have been so fortunate as Baer[49], who saw five instances of keratomalacia, some of them severe, and who did not lose a single child. Again, Peltesohn[29] saw recovery ensue in two out of three cases. In the nine infantile cases of keratomalacia described by Thalberg,[3] the mortality was one alone, or the remarkably small percentage of 11.11. Laas[50] believes that the prognosis *quoad vitam* is not so unfavourable as generally thought if suitable diet be given, a statement with which I find myself in accord.

I believe that age has a good deal to do with the issue, lethal or otherwise. For instance, the average age of my non-fatal cases was 294.5 days as compared with 177.7 days in the fatal cases. In fact, the older the baby the better are the chances of recovery. Another thing, doubtless not devoid of influence, is whether the child is or is not admitted early into hospital, inasmuch as the chances of recovery are clearly better in the former than in the latter event. Syphilitic and marasmic cases, in my experience, justify a better prognosis than those which are due to tuberculosis.

The interval between admission to hospital and death in my thirteen fatal cases ranged from one day to one hundred and nineteen days, and averaged 29.23 days. These figures dispose of Koun's[51] statement, which is to the effect that the children die in from one to four days after the beginning of the corneal lesion.

It is a matter of common knowledge that babies affected with keratomalacia often die from broncho-pneumonia. That condition was found, either during life or after death, in more than one-third of my fatal cases, the exact figure being 38.46 per cent. In some instances the pulmonary condition is unquestionably in the nature of hypostatic pneumonia, which is so often the cause of the fatal termination in cases of marasmus. I cannot resist a suspicion, however, that in another, and perhaps a larger, contingent the broncho-pneumonia merely represents the outstanding symptom of a generalised tuberculosis, which has escaped recognition.

As regards the cornea, the symptoms of keratomalacia may be summed up in the four words, *infiltration, ulceration, perforation,* and *cicatrisation.*

Both corneae are usually affected, although not necessarily at the same moment or to the same extent. The disease was bilateral in 16 (59.25 per cent.) and unilateral in 11

(40.74 per cent.) of my twenty-seven cases. In Knaebel's[32] eighteen cases the disease affected one eye in exactly one-half. Of the five cases published in detail by Braunschweig[27] the corneal condition was bilateral in but two. On the other hand, in Thalberg's[3] thirteen cases (9 infantile and 4 adult) both corneae were involved in all but two.

The first sign that I have myself seen is a slight dulness of the epithelium in some part of the lower half of the cornea, and under suitable treatment (as in case No. 25 of my series), this may clear and *restitutio ad integrum* come about. In the contrary event, the dulness is replaced by a definite infiltration of the corresponding part of the cornea. This may quickly spread, so that the entire cornea, excepting a narrow peripheral zone, in the worst cases, speedily becomes converted into a soft, greyish-white, pulpy slough, resembling damp wash-leather. Trivial photophobia (revealed by the baby keeping his eyes closed) or a whitish appearance of the eye, of which more will be said later, may be, and often is, the first thing noticed by the baby's friends. There is rarely any pronounced swelling, redness, or spasm of the eyelids, so that on opening the eyes of the baby, one receives quite a shock on seeing the destruction that has taken place. Neither is there lacrymation, nor chemosis, nor congestion of the eyeball, nor, indeed, any of the other appearances that we should naturally expect to find associated with so severe and destructive an affection. Indeed, to employ the graphic words of one of the earlier writers, J. N. Fischer,[52] the eyes "have a corpse-like appearance in the still living body." As pointed out by v. Graefe, however, symptoms of irritation may come on later—that is to say, if the baby survive long enough for panophthalmitis to develop.

The eyes often look curiously dry and are more or less insensitive to stimuli, and in severe cases a very striking and characteristic feature is that the baby scarcely resents attempts to examine his eyes, or, at most, moans feebly and piteously during the necessary manipulations. This alone should arouse suspicion as to the nature of the case, suggest extreme care in handling the eyes, and, finally prompt a bad prognosis.

In one very remarkable case in an infant of eleven months (No. 29) the clinical picture was identical with that of *ulcus* *corneae serpens* as seen in the adult eye. The lower fourth of one cornea (the other had perforated some days earlier) was occupied by a trench-like ulcer, the lower edge of which was rounded off, while the upper one was purulent and overhung with epithelium. There was hypopyon. Pneumococci were found in material taken from beneath the ledge of epithelium overhanging the ulceration of the cornea.

A common accompaniment of keratomalacia, first mentioned by von Graefe,[1] is a small, triangular, greasy-looking white patch—an area of so-called "xerosis"—situated in the ocular conjunctiva on the outer or the inner aspect of the cornea.* It may be present in one eye with a transparent cornea, while the cornea of the other eye may be partially or wholly destroyed by keratomalacia, as in Krausse and Knaebel's cases. In several of my own cases the patch of xerosis lay below the cornea, and I have more than once seen the change encroach upon the cornea itself. I have often observed the entire cornea, or a considerable portion of its circumference, encircled by a narrow, slightly raised, glistening white line, occupying the position of the limbus, the conjunctiva near which is sometimes lustreless, dry, and wrinkled concentrically. This curious ring may or may not be associated with the triangular xerotic areas in the ocular conjunctiva, which, in my experience, are much less common. It is doubtless due, like the triangular area, to the lodgment and multiplication *in situ* of the saprophytic and ubiquitous xerosis bacillus, together with local precipitation of the Meibomian secretion (Reymond). Once only have I seen the xerotic changes affect the palpebral conjunctiva. That was in the case of a child suffering severely from congenital syphilis, in whom each lower lid showed a dry, white, greasy-looking patch on its inner aspect. The changes of xerosis, as in case No. 25, may disappear in the course of a few days.

That xerosis of the conjunctiva may be absent from cases of keratomalacia has been pointed out by Horner, Zirm, Leber, Biber, v. Hippel, and Krausse. Xerosis was not observed in one-quarter of the cases of keratomalacia, sixteen in number.

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*This condition was called by von Graefe "acute xerosis," and described by him as affecting the ocular conjunctiva, which became, especially below and at the sides of the cornea, dull and dry and covered with fine scales, and wrinkled and loose when the eyeball was moved.

seen by Braunschweig[27] in the Halle *Augenklinik.* The xerotic patches, as pointed out by several writers, are not essential to the diagnosis of keratomalacia, although when present in little children, they are almost pathognomonic of that ailment. They were noted in thirteen of my own cases, or 41.93 per cent., and in 46.15 per cent. of Thalberg's[3] thirteen cases. On the other hand, in Knaebel's[32] series they have been present in no fewer than 83.3 per cent. of the eighteen cases, and in all of Baer's[49] four cases.

Finally, it should be added that when the globe becomes red, as in commencing panophthalmitis, the xerotic patches are no longer visible.

In one of Leber's cases ulcerations existed upon the conjunctiva, ocular and palpebral.

If the baby's nutrition cannot be improved, the cornea is likely to perforate, a process usually ushered in by localized protrusions of Descemet's membrane, which manifest themselves as so many dark-coloured areas peeping through the pulpy, greyish slough, which covers, as a rule, most of the cornea. Hypopyon is common. Perforation is succeeded by escape of some of the contents of the eyeball, notably the crystalline lens, and the globe eventually shrivels up into a small, white, globular, sightless mass, lying in the depths of the orbit. In a second group of cases, the damaged eyeball, instead of undergoing phthisis bulbi, passes over into a state of secondary glaucoma, together with the remote bulging of its anterior segment, a so-called staphyloma. In still a third group, the cornea becomes prominent without actual perforation having taken place (keratectasia). The result in any case is the same, namely, blindness. But the more common event in severe cases is for the baby to succumb to the underlying malady before there has been time for either phthisis bulbi or staphyloma to develop.

The singular paucity of inflammatory changes, especially of redness, has already been alluded to. But when the cornea has perforated, marked signs of reactionary inflammation are common. They may reach such a pitch, as in one of my cases (No. 15), as almost to arouse a suspicion that a gonorrhoeal infection has been superadded to the keratomalacia. J. Thalberg[3] also mentions this point, and says that in two cases of the kind he reached the mistaken diagnosis of blennorrhoea with secondary gangrene of the cornea.

The destructive nature of the disease is shown by figures recently published by A. Schiele[53] dealing with thirty-three cases of keratomalacia seen in the Kursk district of Russia in the years 1904, 1905, and 1906. Thirteen of the children were rendered totally blind, and seven were blinded in one eye; two recovered with corneal blemishes; and eleven could not be traced. Of the nine children mentioned in Knaebel's[32] series who survived, eleven of the thirteen eyes affected (*i.e.*, five unilateral and four bilateral cases), were known to have been blinded by the disease.

At the same time there are cases and cases of keratomalacia. Some are mild, and others just the reverse. It is important to bear in mind that the progress of the disease may be arrested at almost any stage, with the consequent retention of a more or less useful eye. The common condition in such cases is an incarceration of the iris in the leucoma (*leucoma adherens*), sometimes with the production of a capsular cataract, as happened in several of my own cases. Peltesohn[29] believes that the prognosis of the disease *quoad visum* is not so unfavourable as generally believed, since even in advanced corneal changes there may come about a restitution bordering on the miraculous.

Apart from the ocular appearances, the child presents the usual symptoms of marasmus—that is to say, progressive wasting, lax and withered skin, anaemia, characteristic look, subnormal temperature, and a marked tendency to diarrhoea and vomiting.

Cervical opisthotonos, the "retraction of the head" familiar to every practitioner, was noted in several of my cases of keratomalacia (Nos. 4, 5, 6, 9, and 15), but in one alone (No. 4) did it appear to indicate meningitis, as proved by the *post-mortem* examination. The condition is not uncommon in young children, as well known, under several circumstances, as, for example, marasmus, diarrhoea, middle-ear catarrh, pneumonia, etc., although it is probably never so marked as in post-basic meningitis, where the infant's head may be approximated to his heels. A case published by R. Schultz[40] is worth mentioning in this connection: A baby, aged five months, the thirteenth child of a very anaemic mother, showed ulceration of one and infiltration of the other cornea, associated in each case with a pale and dry conjunctiva, covered with whitish, fatty-looking mucus. There was marked retraction of the head, which finally reached an extreme degree. Death from broncho-pneumonia. Yet at the autopsy, brain and meninges were found to be normal.

The "hydrocephaloid state," sometimes seen in marasmus and diarrhoea, was present in one of my patients (No. 5).

The possibility of confusing marasmus with latent tuberculosis has been mentioned previously. A remittent temperature, which need not reach a high point, is more suggestive of tuberculosis than of marasmus, pure and simple. Under such circumstances it becomes of importance to examine the lungs at frequent intervals, and to investigate the condition of the spleen and lymph nodes. Cough is another symptom that should make us suspect the existence of tuberculosis, and so are quickened respirations without obvious cause.

Despite the wasting, the appetite in some of my patients has been so voracious as to recall Gouvea's[6] remark, that those suffering from Brazilian ophthalmia "will eat anything that happens to be placed in their hands."*

The diagnosis of keratomalacia should offer no difficulty to one who is aware of the existence of the disease. It is important to bear in mind that neither the existence of xerosis nor the presence of corneal changes in both eyes is essential to the diagnosis. It would, in my opinion, be a fair generalisation to say that ulcers of the cornea, especially if bilateral, in infants between the age of two and twelve months, are far more likely to be due to keratomalacia than to any other cause. Such patients are too old for the corneal complications of gonorrhoeal ophthalmia, and almost too young to suffer from the other great cause of corneal ulceration in children, *viz.*, eczematous keratitis. While this is true, it is curious to notice from the case-reports scattered throughout literature, how often the symptoms of keratomalacia have been confused with those of ophthalmia neonatorum, notwithstanding the very different age-incidence of the two ailments. Indeed, sometimes the distinction between the diseases is not simple, as in one of my own cases (No. 30).

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*Ullersperger[5] gives an account of an adult with "Brazilian ophthalmia" whose appetite was so ravenous that an iron mask had to be put over his face for the purpose of preventing him from tearing to pieces all the fallen fruit he could lay his hands on. On one occasion, when without his mask, Ullersperger's patient swallowed four ounces of spirits of camphor.

Confusion, however, is much more likely to arise between keratomalacia and two conditions, both of which occur in childhood: (1) keratitis xerotica, and (2) tropho-neurotic keratitis.

(1) *Keratitis xerotica* (Feuer) is liable to occur in children, irrespective of age, who lie for long together in the semi-conscious state known as "coma-vigil" from whatever cause. The semi-closed eyelids allow the lower third of the cornea to be exposed to the air. The consequence is that that portion of the cornea becomes dry, and this, along with the grave general state of the child, allows the damaged cornea to fall a ready prey to any pyogenic micro-organisms that may chance to be present in the conjunctival sac. An ulcer, shallow at first, but soon becoming deeper, forms near the lower margin of the cornea, and, if the child live long enough, this becomes complicated with deeper changes, which may lead to loss of the eye. The affection, so far as I have seen, is invariably bilateral, and is of slow progress compared with most cases of keratomalacia.

(2) *Trophoneurotic keratitis*, a rare and painless disease of which I have seen two instances only in children, is caused by paralysis of the fifth cranial nerve. It gives rise to a peculiar appearance of the cornea, since the entire anterior epithelium is cast off except for a narrow rim at the extreme periphery. In its further course the cornea becomes cloudy, pus appears in the anterior chamber, and the eye is lost by suppuration, or, at best, is left with a corneal cicatrix in which the prolapsed iris has become entangled. There is anaesthesia of the conjunctiva of the upper and lower eyelid on the affected side.

Almost everybody, from Dr. Joseph Brown downwards, who has written about keratomalacia has compared the process, aptly enough, with that brought about in dogs fed, as in Magendie's famous experiment, with sugar and distilled water or other non-azotised food. In those animals an early and constant sign of inanition was furnished, as everybody knows, by sloughing of the corneae and consequent destruction of the eyeballs.

Indeed, it cannot be doubted that keratomalacia is remotely due to lowered vitality in a tissue devoid of blood-vessels and exposed to slight injuries. The fact that in almost 50 per cent. of the cases the affection is limited to one eye, suggests that slight, inappreciable traumatisms may have a considerable determining share in the causation of keratomalacia. A case of my own (No. 16) may be briefly mentioned in connection with this point. An ill-nourished child of fourteen months suffered from a sloughing right cornea, and, as a congenital defect, there was an incomplete coloboma of the corresponding upper eyelid. The inference was that the gap had allowed of some slight injury, as by an intruding foreign body, of the exposed cornea. I recall another case (not included in the present series) of a wasted infant admitted with double coloboma of the left upper eyelid, who suffered from severe and perforative ulceration of the corresponding cornea.

The corneal changes, in fact, appear to be analogous to the localised gangrene of the skin over the sacrum, the heels, and other bony prominences which is sometimes observed towards the terminal stages of athrepsia. Such acute bed-sores, for that is what they amount to, were noted in cases of keratomalacia reported by Baer[49] and Lagrange[51] and by Cabannes and Koun[51] respectively. They existed in one of my own patients. By Förster[37], of Breslau, indeed, it was supposed that pressure of the eyelids upon the enfeebled cornea was enough to determine ulceration, much as pretibial bed-sores are believed to be produced in typhoid fever and other severe constitutional diseases by the mere weight of the bed clothes. This view seems to be supported by J. Thalberg[3].

Horner, Zirm, and some other authors believed that the primary cause of the disease was to be found in desiccation of the corneal epithelium exposed by inadequate closure of the eyelids. My own experience does not support this view. At the same time the fact that the disease almost invariably begins in the lower half of the cornea is suggestive. Keratitis e lagophthalmo, which is unquestionably the result of exposure of the cornea, presents a different clinical picture. The fact that in almost one-half of the cases keratomalacia affects one eye alone is dead against the theory. Lastly, direct observation has convinced me that in the earliest stages of keratomalacia the lids are almost invariably kept shut, and that coma-vigil is seen only in the advanced stages—that is to say, when the patient has become dangerously ill and the mischief has already been done. My personal experience is borne out by a statement made by Krausse,[54] namely, that in the Jena *Augenklinik* one case alone of keratomalacia has been met with in which the lids were not closed completely. Many cases reported, however, including some of my own, expressly mention that the lids have kept more or less open.

I have learned to look with circumspection upon any corneal ulcer, no matter how trivial it may seem, in a baby who shows signs of malnutrition. A recent case (No. 26) points the necessity for this precaution. A somewhat ill-nourished baby, aged eight months, suffered from symptoms of a mild conjunctivitis of the Koch-Weeks' type, and, in addition, from a trivial and localised dulness of one cornea. The cause of the corneal mischief was not immediately apparent. Unfortunately, no great importance was attached to the condition, and ordinary treatment was prescribed. A fortnight later, however, the baby again attended, and it was then seen that the condition of the cornea was most serious—it was sloughing and had a keratocele towards its centre. The patient was admitted to the Hospital, but too late to prevent the formation of an adherent leucoma.

Keratomalacia may be said to be a malady devoid of distinctive pathology. Dötsch,[55] following the example of Ernst[56] and of Fuchs,[57] has insisted upon the importance to be attached to a deposition of keratohyalin in the superficial layers of the conjunctival epithelium, which he found to be present in the xerosis accompanying three cases of keratomalacia. This process of keratinisation he regarded as typical of the affection in question. These observations have been confirmed by Stephen Mayou[58] in so far as regards six cases of epithelial xerosis, an affection, as I have shown elsewhere,[59] not uncommon in England in the summer months among the inmates of poor-class residential schools. It is not, of course, associated with any destructive corneal processes. Mayou found a layer of keratin on the surface of the epithelium, with granules of keratohyalin in the deeper layers beneath it, and still further down, a well-marked layer of prickle-cells. In Mayou's view, the essential change in the formation of the patches of xerosis is the keratinisation of the epithelium, to which the Meibomian secretion, known to include the xerosis bacillus, becomes adherent, owing to altered surface tension. Deficient lacrymal secretion is another factor in the causation of the change.

The coarse pathology of the case, however, will essentially depend upon the stage when the eye is examined. If before perforation has taken place, there will be more or less extended loss of the surface epithelium, an infiltration with round cells of the corneal lamellae, together with other evidences of inflammation and ulceration of the cornea, about which there is nothing distinctive. Bowman's membrane will be missing from the ulcerated spot, while Descemet's membrane will persist practically unchanged. The iris and the ciliary body, even at this early stage, will manifest marked evidences of inflammation. When perforation has occurred, the pathological picture changes according to several circumstances, the chief of which are the length of time that has elapsed between perforation and removal of the eyeball, and the septic accidents that may befall the globe. The common pathological appearance, however, is that of an adhesion of iris to cornea by connective tissue, round cells, pigmented cells, and blood-vessels of new formation. The ciliary body, sclera, choroid, retina, and optic disk are in a state of exudative inflammation, so that the vitreous humour usually includes more or less abundant inflammatory exudation.

In this place there is no need to describe the pathology of keratectasia or of staphyloma or of secondary glaucoma.

If the pathology of keratomalacia be not distinctive, neither is the bacteriology. Despite many investigations by various authors, no causal micro-organism has yet been identified. The microbes found in discharge from the conjunctiva or in scrapings from the cornea have included xerosis bacilli, staphylococci, streptococci, pneumobacilli, coli bacteria, and gonococci, as well as various cocci and bacilli not more particularly identified. In a remarkable case by Angus McNab,[60] the bacillus coli communis was found with gonococci. This diversity and multiplicity of bacteriological results is strongly suggestive of there being no micro-organism peculiar to keratomalacia.

My personal investigations lead me to the same conclusion. —(a) In the patches of conjunctival xerosis, I have never yet failed to find the xerosis bacillus, sometimes alone but oftener associated with the commoner micro-organisms of the conjunctival sac, especially with the staphylococcus pyogenes albus. (b) As regards material taken direct from the corneal ulceration, the findings have been somewhat different. As I have pointed out elsewhere, the pneumococcus is by far the commonest pathogenic organism obtained under those circumstances. In eleven of the cases which form the basis of the present communication the pneumococcus was present in five (or 45.45 per cent.), in pure culture in two, and mixed with other microbes in three. Other micro-organisms found by me included the staphylococcus pyogenes albus (5), the xerosis bacillus (4), the staphylococcus pyogenes aureus (1), the Morax-Axenfeld diplobacillus (1), the gonococcus (2), the micrococcus catarrhalis (1), sarcinae (1), the aspergillus fumigatus (1), and, lastly, a Gram-positive streptobacillus, which coagulated and acidified litmus milk in twenty-four hours, and which fermented lactose.

In two of my cases (Nos. 30 and 31) the gonococcus was found in scrapings from the affected corneae. In both xerosis bacilli were also present. (Xerosis conjunctivae was present in each patient.) In the one case (No. 31) the child's age, *viz.,* eight months, excluded anything like ophthalmia neonatorum, but in the other case (No. 30), the age was only six weeks, and there was a history of a mild non-bacterial conjunctivitis beginning a few days after birth. When the corneae became affected, however, the symptoms of conjunctivitis were ill-marked, while those of sloughing cornea were characteristic, and xerosis conjunctivae was present, in addition. Gonococci were found not only in discharge from the conjunctiva but also in scrapings from the corneae, and were confirmed by repeated culture on blood-agar. The baby was somewhat ill-nourished (weight 7 lbs. 13 ozs.). Of the two views, namely, that this was an instance either of very mild ophthalmia with corneal complications, or else of keratomalacia, the evidence points, I think, to the latter being the true explanation of the case. So far as I know, the case by Angus McNab is the only one yet published where the gonococcus appeared to be the cause of keratomalacia, although there the bacillus coli communis was also present. These three cases, *i. e.,* McNab's and my own, suggest that the gonococcus may, on rare occasions, affect the cornea to the exclusion, complete or almost complete, of the conjunctiva.

The xerosis bacillus is now known to be a mere saprophyte, an almost constant inhabitant of the conjunctival sac, healthy or diseased. Hence, the name proposed, the *bacillus conjunctivae communis,* by Mr. Arnold Lawson[61] for this ubiquitous microbe. Most of the other bacteria included in the list are common enough even in conjunctivae that to all appearances are healthy. It is probable that no particular micro-organism is associated with keratomalacia, but that lowered vitality and all that such implies in the defensive powers of the body in general and of the cornea in particular is enough to allow the commoner pyogenic organisms to exert their characteristic properties, and in that way to bring about the malady. The fact that the pneumococcus need not necessarily be present in keratomalacia proves that it is not essential to the suppurative process, although in my experience, it is the commonest cause of the latter. It has been found, in pure culture or otherwise, by other observers besides myself —as, for example, by E. von Hippel,[62] Knaebel,[32] Braunschweig,[27] and Doetsch.[55]

We may conclude, then, that in no case has a specific microbe been found by any of the numerous observers who have investigated the bacteriology of keratomalacia.

The fact has already been mentioned casually that in four cases of syphilitic keratomalacia I succeeded in demonstrating the spirochaeta pallida in scrapings from the diseased corneae. In one case (No. 20) the discovery clinched an otherwise doubtful diagnosis. The infant, aged three months, "snuffled," was wasted, and showed a few small ulcerated papules about the anus, together with slight splenic and hepatic enlargements. Both corneae had sloughed. The syphilitic origin of the ocular symptoms was merely suspected until all doubt upon the point was laid at rest by the actual discovery of the treponemata.

TREATMENT.

The first requirement is to place the baby under the best possible conditions for recovery, and that is obviously in the hospital ward, where the details of feeding can be attended to properly, local remedies can be applied systematically, and where the child can be kept warm, if necessary in an incubator. The affection is one where careful nursing counts for a great deal, another reason (if one be needed) for treating the patient in hospital. It would, in my opinion, be an excellent rule in the casualty department of every children's hospital to admit for observation any badly nourished baby who showed xerosis conjunctivae or the least ulceration of the cornea. J. Thalberg[3] established such a practice at the Elizabeth Children's Hospital at St. Petersburg.

Treatment itself should be both *general* and *local*.

The general treatment, speaking broadly, is that suitable for marasmus. It includes the provision of a wet-nurse, if possible, and, anyhow, the administration of such food, predigested or otherwise, as the baby can be induced to take and to retain. Rotch[63] recommends that a milk mixture should be given "which contains a low percentage of fat, a high percentage of sugar, and a moderate percentage of proteids." Such a mixture is represented by the formula: fat, 0.5; sugar, 6.00; proteids, 1.00; lime water to 5.00. "Virol," an emulsion of bone marrow, yolk of egg, and malt extract, has appeared to me to be beneficial in these babies. Baer,[49] whose exceptionally happy experiences have been mentioned earlier, advocated the feeding of the babies with milk and lime water. His treatment, in fact, consisted of little else! Holmes Spicer[13] recommended the administration of milk, properly diluted, cod liver oil, and raw meat juice.

The giving of alcohol in the form of brandy has seemed to me to be most useful. The first hint I had as to the value of stimulants in keratomalacia was gained from a case that fell under my notice several years ago. A little boy, aged 12 months, was brought to me with the right cornea hazy. He was a tuberculous subject. A week later, despite the use of physostigmine, the cornea was represented by a greyish-white slough, the size of a threepenny bit, separated by a shallow trench from the unaffected parts. The eyeball was scarcely reddened, but, curiously enough, the upper retrotarsal fold was extremely prominent, as the result of oedematous infiltration. The corneal process was associated with the presence of the staphylococcus pyogenes albus and sarcinae. The baby was admitted to hospital, but owing to some misunderstanding, was removed by his mother, an exceptionally ignorant, stupid, and obstinate person, after a few days' stay. Feeling interested in the case, I traced the child to his home in one of the poorest parts of London. The cornea was then disorganised, and the infant, reduced to skin and bone, and as yellow as a guinea, appeared to me to be on the verge of death. The mother, in answer to my enquiries, told me that the child was being fed on "drops of brandy." Some two years later, to my great surprise, the child, then in blooming health, was brought to the out-patient department of the Queen's Hospital, on account of a large staphyloma which had developed in the eye with keratomalacia. Operation was refused, but eventually the staphyloma was sunken by an accidental blow upon the eye.

Cod-liver oil has a distinct value, more especially if it be given not by the mouth but by inunction, say, of one drachm three or four times a day. It was recommended by Holmes Spicer[13] in 1893, who suggested that in cases where it could not be retained, a little cream might be substituted. Mori,[8] indeed, believes that keratomalacia is essentially due to a deficiency of fat. On this view, he has, in spite of the diarrhoea often present, used cod-liver oil, and by that means has succeeded in curing even severe cases of the Japanese "Hikan." Neats-foot oil, an old-fashioned remedy for wasting children in English country districts, has seemed to me to be as valuable as cod-liver oil, than which it is certainly more economical.

If syphilis be present, mercury must be given. The fact is significant that some of the cases of keratomalacia that have recovered (Zirm, Petlesohn, Evans) have done so under specific treatment. The rapidity of action, desirable in these desperate cases, is probably best secured by giving mercury with chalk, gr. ½ to gr. 1, three times a day, and by rubbing in fifteen grains—*i.e.*, a piece roughly of the size of a pea—of mercurial ointment every night. In order to prevent the medicine from being carried off by the bowels, it is advisable to combine with each dose of the mercurial gr. ½ of sodium bicarbonate and gr. 1 of aromatic powder of chalk. Sublimate baths were employed in one of Petlesohn's cases which got well. Intra-muscular injections of a soluble mercurial seem out of place in babies of tender age, a remark that applies with added force to intravenous injections.

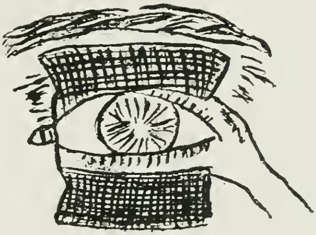
The local treatment of the eyes will include the frequent use of douches of hot saline or boric lotion. By Gama Lobo and de Gouvea great importance was attached to steam, at a temperature of 40° C., directed against the closed eyelids of the patient for fifteen minutes once a day or oftener. In the intervals between the application of the steam, the eyes were kept closed by means of a pressure-bandage. However this may be, hot boric fomentations are certainly of use both in limiting necrosis and in hastening separation of the slough.

Among antiseptics, those that have rendered me yeoman service are argyrol and quinine and hydrogen peroxide. The first-named has been employed as a 15 per cent. to 25 per cent. solution dropped into the eyes at frequent intervals. The second has generally been used, as recommended by Arnold Lawson,[64] as a lotion containing four grains of quinine sulphate to the ounce of distilled water, just enough sulphuric acid being added to ensure a clear solution. The quinine is freely applied to the eyes every four hours, and in the intervals, they are kept tied up with gauze soaked in the lotion. Hydrogen peroxide, employed as Merck's "perhydrol," serves several useful purposes in these cases. To begin with, it is a most efficient antiseptic, and has the advantage—no slight one in keratomalacia—of being perfectly innocuous. Secondly, it yields accurate information as to the progress of the corneal ulceration, for evolution of gas when the "perhydrol" is brought into contact with the ulcer, becomes less and less marked as the latter heals. To obtain the best results, however, the baby's eyelids should be separated by retractors (if necessary under general anaesthesia), and the "perhydrol" be allowed to form, as it were, a pool of liquid, at the bottom of which lies the cornea. Several editions of the "perhydrol" are employed, and the process is repeated once or twice a day.

The employment of physostigmine, strongly recommended by J. Thalberg,[3] who saw much of the disease in Russia, is endorsed by Holmes Spicer[13] and by Adolf Knaebel.[32] Thalberg laid some stress upon the use of an ointment containing about ½ per cent. of physostigmine in vaseline, as opposed to the use of a watery solution. The alkaloid might equally well be dissolved in sterile oil. My own experience has led me to place a high value upon physostigmine, which assuredly succeeds better than anything else I have tried in keratomalacia, unless it be pilocarpine. Now and then it is surprising to see how quickly the cornea casts its slough under the use of the remedy.

If the gangrene of the cornea can be mastered, the physostigmine should be replaced by atropine, also in oily solution.

It need scarcely be added that during the more acute stages of the disease the eyes should be kept tied up with a pad and bandage, and that the utmost care should be exercised in making the necessary examinations, applications, and so forth. The importance of care in this respect is shown by cases reported by Thalberg[3] and Biber[65] respectively, where the lens escaped from the eyes of babies on attempting to separate the eyelids. A precisely similar accident happened in one of my own cases.



As to surgical measures, I have seen an ulcer go on to perforation despite energetic treatment, as by scraping and the application of liquified carbolic acid, and the use of the galvano- or thermo-cautery. Several such cases are mentioned in the schedule to this communication. In keratomalacia it seems as if the vital powers were at so low an ebb that the cornea is unable to furnish the reaction necessary to healing. But that objection can scarcely be raised to the adoption of the Saemisch (or, rather, Guthrie) section, from which I have seen benefit when the cornea was falling into a state of keratectasia. A remarkable case has been published by Dr. Thomas C. Evans,[22] in which a large staphyloma, resulting from keratomalacia in a baby, was treated by multiple punctures with a Graefe knife. The operation was repeated at intervals of about a week for five weeks, at the end of which time the staphyloma is stated to have been replaced by a flattened corneal cicatrix, while the eye retained its shape, and tension was normal.

If the baby's eyelids are incompletely closed it will be advisable to suture them together, as in a case mentioned by Knaebel (*loco citato*,[32] case No. II), or to perform tarsorrhaphy. The ingenious little contrivance described by Dr. L. M. Francis,[56] of Buffalo, would appear likely to be of service under these conditions. A piece of gauze is cemented to the upper and the lower eyelid by means of flexile collodion. A silk thread with its free end towards the outer canthus is placed in the creases, and the flaps of gauze are turned over and cemented to the fixed pieces of gauze. Then, by tying the ends of the thread, the edges of the lids are brought into apposition.

CONCLUSIONS.

1. Keratomalacia in young children is known to occur in practically every country the scientific records of which are available for inspection.

2. It affects children whose ages usually range from three to twenty months, and is especially frequent at about the eighth month of life.

3. It occurs chiefly in the children of the poorer classes.

4. It affects both eyes in about one-half of the babies.

5. It is associated with xerosis conjunctivæ in about 50 per cent. of the cases.

6. It occurs only in babies whose vitality has been seriously reduced by "epidemic" or "zymotic enteritis," congenital syphilis, athrepsia, or tuberculosis, named in their order of frequency.

7. In London its seasonal incidence closely follows that of zymotic enteritis.

8. Its mortality amounts to about 50 per cent. of those affected. The immediate cause of death is usually bronchopneumonia or exhaustion.

9. It leads to blindness in about one-half of the children who survive.

10. It is associated with no specific micro-organism, although in scrapings from the cornea the pneumococcus may be found in about one-half of the cases.

APPENDIX.

Cases of Keratomalacia.

1. Latham, Grace, 8 months. Admitted August 25th, 1897. Died August 26th, 1897.

History.—Born at term, the 12th in the family. Stated to have had no food other than her mother's milk. Although she has suffered from bronchitis since she was born, still she is stated to have been otherwise healthy until four months ago. Her general condition has become much worse during the last week. Five days before coming under notice the mother noticed "a speck" on the baby's left eye, which is said to be sometimes "a little open during sleep."

Upon Admission.—A wretchedly thin and marasmic infant, weighing seven pounds. Her skin is wrinkled and yellowish. No teeth. Temperature 97° F. L. E.—a small quantity of yellowish-white discharge is present. A circular infiltration, 2 mm. in diameter, lies near center of the inner side of the cornea, and there is a layer of yellowish pus in the lower part of the anterior chamber. No patches of conjunctival xerosis. There is hardly any redness of the eye, which looks dry, as it were. During sleep there is slight lagophthalmos of the lid.

Treatment and Progress.—Admitted to Hospital. Brandy and a mixture containing ipecacuanha and ammonia given. The baby died at 4 a. m. on August 26th, 1897.

Post-mortem Examination.

A mass of cretaceous pus on vortex of right hemisphere below the pia mater, size of a one shilling piece. No meningitis. Brain otherwise normal. A cavity, the size of a small filbert, lies towards the base of the upper lobe of the right lung. Pleura round thickened, and universally adherent. The rest of the upper lobe contained numerous miliary tubercles. The other lung was healthy. No tubercle could be found in the other viscera.

Pathological Examination of the Affected Eye.

The central parts of the cornea are attenuated, the anterior epithelium being reduced to from one to three layers of flattened cells, and Bowman's membrane being absent. The cornea, as a whole, shows a dense infiltration with leucocytes. The vessels of the iris and ciliary body are gorged with blood. Both those structures are thickened and densely infiltrated, forming beautiful microscopical specimens of intensely inflamed tissues. The pigmented epithelium of the iris is in place. The angles of the anterior chamber filled with a fibrinous exudation including numerous pus cells and some pigmented particles. A similar exudation lines the posterior surface of the cornea, being now thick and again thin according to the exact part examined. No lens in specimen. Pars ciliaris retinae covered with a layer of exudation. Retina, chorioid, and sclera all inflamed and more or less disorganized.

2.—Maskell, Emily, 1 year. First attendance March 16th, 1898.

History.—A full-time child, born after an easy labor. A fine baby, quite healthy. For the first three months fed on breast exclusively, and after that breast and bread and biscuits. The breast was given up in January—that is to say, when the baby was about ten months' old. The food since then has included Nestle's milk, fish, and potatoes. On February 20th the baby was taken with diarrhoea (stools loose and green) and sickness. She was cutting two teeth at the time. The child vomited every time she was fed, and the stools were very offensive. She wasted, and lay quite still in bed all the day long. Convulsions also made their appearance. This illness is said to have lasted for fourteen days, and since its end the child "has picked up very well." Further questioning brings out the additional facts that the baby was dangerously ill for three days, never moved, and kept the eyes shut. A yellow discharge was then present, and a medical man, who opened the eyes, stated that "ulcers were present."

Present Condition.—R. E., adherent leucoma present in the lower-inner part of the cornea. L. E., a large scooped-out ulcer present in the lower part of the cornea, but without perforation. No redness of eyes, and no frothy conjunctival patches.

Progress.—April 6th, 1908. No redness of eyes.

3.—Brown, James W., 10 months. Admitted August 17th, 1898. Died September 8th, 1898.

History.—The baby has suffered from diarrhoea for about six weeks, and the eyes have been affected for some seven days. The baby has been brought to this hospital as a casualty, and some lotion was given, but the eyes have failed to improve. The baby does not sleep with open lids.

Upon Admission.—A very thin, wasted, and weakly baby. Has diarrhoea. A large sloughing ulceration is present over the lower part of each cornea. No frothy patches in ocular conjunctiva. Signs of inflammation not at all pronounced.

Progress and Treatment.—The corneal ulcers were touched with the liquified carbolic acid of the British Pharmacopoeia. The after-treatment included drops of atropine and cocaine, and hot fomentations applied to the eyes every four hours. August 19th.—Iodoform to be dusted twice a day over the corneal ulcerations. August 23rd.—Baby seems better. No diarrhoea. Pupils not much dilated, but the corneal ulcerations are looking better. Ung. Flav. et Atrop., bis die. Atropine drops to be continued. August 27th.—Although the eyes have improved, the baby himself is not so well, and diarrhoea has started again. September 7th.—Child much emaciated. He lies with semi-closed eyelids, and presents at the lower third of each cornea a dense opacity, the surface of which is somewhat depressed. Pupils dilated; they are free from adhesions. No pus in anterior chamber. Corneal sensibility unimpaired. September 6th.—Baby suddenly became worse and died this evening.

Until the morning of August 29th the temperature remained below 99.4° F. On the day named, however, it was on successive occasions 99.6° F., 100° F., and next day in the morning 102° F., but by night had fallen to 97.8° F. From then to death, nine days later, it remained subnormal.

Stools 0 to 4 a day.

No post-mortem examination could be obtained.

4.—Thornhill, Walter, 8 months. Admitted December 14th, 1898. Died February 5th, 1899.

History.—The baby, when about six months of age, attended Moorfields, where a diagnosis of "purulent ophthalmia" was made. Dates of attendance were from September 22nd to November 15th. The left eye is said to have been affected for a week. Six days ago a speck was noticed upon that eye, and the speck is stated to have got bigger since.

Condition on Admission.—A weakly-looking baby, with eczema behind the ears. L. E., the lower and outer quadrant of the cornea is occupied by a slough, the remainder of the cornea being cloudy. No pus can be seen in the anterior chamber. Palpebral conjunctiva reddened. Muco-purulent discharge. There is a good deal of ciliary congestion.

Treatment and Progress.—Under A. C. E. the slough was scraped away, without opening the cornea, and pure liquified carbolic acid was immediately applied to the floor and edges of the ulcer. Atropine drops (grs. 2), ter die; iodoform to ulcer, bis; pad and bandage. December 16th.—There was not much change in the condition of the eye, the pupil of which has not responded in the least to atropine. Sores on face and head. December 19th.—Child seems ill in himself. Cervical opisthotonos. L. E., lids swollen. Conjunctiva reddened, and some muco-purulent discharge. Ciliary redness rather less marked. Cornea rather clearer, but whitish slough lies over position of abscess. It is, however, difficult to obtain a good view of the cornea even with retractors, as the child persistently turns the eye outwards. Pupil not dilated. December 23rd.—Perforation lower part left cornea with prolapse of the iris. Pupil not dilated, in spite of the atropine (drops and solid) that has been applied and the leech used to the temple. December 29th.—Lids less swollen. There are one or two pinkish patches in the cornea, the substance of which is cloudy. Pupil not well dilated. Sores are still present on the face and head. January 11th, 1899.—Mercurial inunction and Hydr. c. Cret., gr. 1, omne nocte. Child drowsy and languid. Some nasal discharge. Sores have healed. The lungs show no physical signs, but the baby is evidently ill. The left eye is better, and the conjunctiva clear. January 18th.—Temperature has become very intermittent, and the pulse is occasionally a little irregular. There is nohing definite in the right fundus oculi, but it seems indistinct. January 25th.—Baby is undoubtedly worse. More drowsy. Pulse 100, irregular, compressible. Mercurials stopped. January 28th.—Brandy, thirty drops every two hours. February 1st.—Temperature rose suddenly to 102° F. Respirations 48, with a tendency to the Cheyne-Stokes character. Child very drowsy. February 2nd.—Takes food badly. Pulse small and irregular. Respirations, 36 to 48 per minute, markedly Cheyne-Stokes in character. February 3rd.—Baby restless. Respirations, 56 per minute, shallow and less markedly of the Cheyne-Stokes character. Pulse, irregular, 108 per minute. Temperature, 98° F. and 99.4° F. Baby fed with nasal tube. February 4th.—Baby evidently sinking. Pronounced pallor. Respirations, shallow, 88 to the minute. Pulse 172, thready. In evening child became restless, unable to take any nourishment, and at 10 o'clock p. m. temperature rose to 107° F. At 11 o'clock p. m. two minims of morphia injected. The child died at 3:25 p. m. on February 5th, 1899.

Stools.—1 to 2 motions daily during stay in Hospital.

Temperature.—Temperature remained about normal until January 5th, when it rose to 101.6° F. On the evening of January 6th it fell to normal, and remained so until January 13th. It then alternated from 97.8° F. to 100.4° F. until January 31st. On February 1st it rose to 102.2° F. On February 4th the evening temperature reached 106.6° F. The temperatures recorded on the day of the baby's death were—99.4° F., 97° F., and 97.4° F.

Pulse and Respirations.—February 1st, P. 116, and R. 48; February 2nd, P. 96, and R. 36; February 3rd, P. 108, and R. 56; and February 4th, P. 172, and R. 88.

Post-Mortem Examination.

February 6th, 1899.—Body very wasted. Left eye shows signs of severe inflammation. Pleurae; no adhesions and no excess of fluid. Lungs: no signs of tubercle and healthy. No evidence of tuberculous softening in the bronchial or mesenteric glands. Pericardium: neither adhesions nor excess of fluid. Heart: healthy; orifices contracted. Valves: healthy. Brain: very soft in places, especially left frontal lobe; no tubercle seen on arteries or on surface of brain. No actual abscess, but excess of purulent fluid in ventricles, and purulent exudation on basal surface. Abdomen, spleen, kidneys, genito-urinary tract, liver, and alimentary canal free from morbid changes. Eye (left): signs of acute inflammation; the optic nerve manifested no naked-eye evidences of inflammation.

Diagnosis: general meningitis.

Examination of the Eye.

Macroscopic.—Leucoma with adhesion of the central parts of the iris and the anterior pole of the lens to the cornea.

5.—Payne, Selina, aged 6 months. Attended Evelina Hospital on July 20th, 1900. Death on July 30th, 1900.

History.—This child, the third in the family, was born at term after a natural labor. The eyes have always been "weak," and running with yellowish-white matter since birth. The nose also has run continuously.

On July 14th the baby was seized with diarrhoea and convulsions. On the 16th she was brought as an out-patient to the Evelina Hospital, where she was treated with bismuth and a mixture containing castor oil.

The bowels are said to act at least ten times a day, and the stools are watery, of light color, and offensive to the sense of smell. There is now no vomiting. The baby has been losing flesh quickly. She is said to be subject to "inwardly convulsions," during which the eyes get fixed and the arms and legs become stiff. Since the illness began on July 14th the child has been noticed to sleep with her eyes half-open, and to throw her head back.

The baby was fed on the breast for the first month of her life. Since then she has had no other food except boiled nursery biscuits, together with milk and barley water (equal parts).

On Admission.—A wasted baby, who weighs 10 lbs. 12 ozs. She suffers from diarrhoea and vomiting. The retraction of the head and the "scaphoid" abdomen suggest that she may be suffering from basal meningitis. Her temperature is of a very fluctuating character, reaching 103.2° F. on one occasion.

Eyes.—The corneae are clear. The peculiarity of the case is that the lower half of each cornea is encircled by a narrow glistening white line at the limbus, and in addition to that, a small area of xerosis lies in the conjunctiva on the outer side of each cornea.

Both corneae at a later stage in the case began to slough, but unfortunately the notes give no more precise details. It is, however, certain that the baby died ten days after she was first seen by me.

Bacteriological Report.—Cover-glasses were smeared and serum tubes inoculated from the whitish material lying at the limbus. The former contained Gram-positive cocci and bacilli, which were identified by culture as staphylococcus pyogenes albus and xerosis bacillus.

6.—Bennett, Ernest, 4 months. Admitted to the Queen's Hospital on February 26th, 1902. Death on May 17th, 1902.

Baby brought to out-patients on February 26th, 1902, suffering from ulceration of the corneae. He was a full-time child, and said to have been well-nourished at birth. A week after birth he refused to "suck," and since then has been fed with great difficulty on cows' milk and barley water. No history of ophthalmia neonatorum. Never "snuffles" or has any rashes or other signs of congenital syphilis. The child stated to have had a "fit" on the eighth day after birth. He is the youngest of four children, of whom the other three are said to be healthy. The eyes are stated to have been bad for about one month.

On Admission.—He is a puny, apathetic, wasted baby, weighing in the nude 8½ lbs. only. There is no evidence of syphilis. T. 97.4° F. R. E. A small infiltration lies towards the center of the cornea and stains faintly when treated with fluorescein. T. n. L. E. A large and dense infiltration, which stains deeply with fluorescein, covers the center of the cornea. There is merely a trace of ciliary redness. The eye looks dry, as it were. No inflammatory changes in the eyelids. No changes in the palpebral conjunctiva. Tear passages normal. T. n. The eyes can be examined and cleansed without the baby evincing the least sign of discomfort. Its silence and apathy, indeed, are striking features of the case.

Admitted to the Hospital.

Treatment and Progress.—February 27th.—Patient seems to be more lively. Takes milk fairly well. Brandy, five drops every two hours. March 5th.—Child now weighs 7½ lbs., so that he has lost one pound since admission to the hospital. T. has not risen above 99.8° F. The bowels are usually opened three times a day, but sometimes not at all. Head is retracted. R. E. ulcer has healed, and is now replaced by a small more or less central nebula. L. E. trifling dusky ciliary redness. The entire pupil is hidden behind a purulent ulcer of the cornea. Pus can be recognized towards the outer side of the anterior chamber. The almost complete apathy of the infant is very marked. No physical signs in the chest or abdomen. March 7th.—Condition much the same. Head is, however, more retracted, and since yesterday there has been a discharge from both ears. A few rhonchi to be heard in the lungs. R. E. condition unchanged. L. E. ciliary redness more marked. There is a clear spot in the center of the ulceration (keratoceie). The hypopyon has spread to the upper part of the anterior chamber. Patient takes food rather better. March 9th.—The whole of the left cornea is now involved by the purulent infiltration, and the cornea is on the point of perforating. The cornea surrounded by injected zone. Child's general condition is about the same—still takes milk well. Otorrhoea. No retraction of head during last week. During the last few days the ulceration has extended and the whole cornea is now covered by a white slough, in the center of which is a clear area, gradually increasing in size. Vascularity of the ocular conjunctiva has increased, and there is now a very distinct ring of radially arranged dilated vessels around the edge of the cornea. When seen at 11 p. m. child was in his usual condition. On being looked at ten minutes afterwards, however, the ulcer was found to have perforated, and the extruded crystalline lens to be lying outside the eye at the inner canthus. The vitreous was bulging towards into the opening into the eyeball. This untoward event has not in any way disturbed the patient's equanimity. March 10th.—Opening in cornea now concealed by a whitish material. Eyelids inflamed. March 12th.—Weight 7 ℔s. The left eyeball is in a condiion of panophthalmitis, and is somewhat proptosed. March 18th.—The left eye is quite disorganized, and is discharging pus. No inflammation of eyelids now. March 19th.—Weight, 7 ℔s. General condition unchanged. Left eye still discharging. March 26th—No change. Weight, 7 ℔s. April 2nd.—Weight 6¾ ℔s. General condition unchanged. The left eyeball is now shrunken, discharges but little, and signs of inflammation have almost disappeared. Mist. ol. morrh. et ferri. one drachm three times a day. May 7th.—The left eye is now represented by a small nodule, free from redness, lying in the orbit. A button of granulation tissue exists in the former site of the cornea. Physical signs being detected in the baby's chest, I requested my colleague, Dr. J. H. Sequeira, to examine the case. His report is appended:—

"There is evident consolidation of the left upper lobe, with breaking down of the lung. There are enlarged glands in the mesentery, and the spleen also is enlarged, being easily palpable a finger's breadth below the costal margin. I consider the lung and glands certainly, and possibly also the splenic trouble, as tuberculous."

May 13th.—Local conditions unchanged. May 17th, 1902.—Death. Autopsy refused.

During the three months the baby remained in hospital successive weights were: 8½ lbs., 7½ lbs., 7 lbs., 6¾ lbs., 7 lbs., 6¾ lbs., 7 lbs., and 6¼ lbs.

7.—Barnett, Kathleen. 7 months. Out-patient June 11th, 1903, to June 18th, 1903. Admitted June 18th, 1903. Discharged August 6th, 1903.

History.—Patient, the 14th child, born at term. For three weeks the patient was on the breast, and since then has been brought up on Ridge's food and Nestle's milk given together. The mother suffers from paralysis agitans. The 12th child in the family, a girl, died when three months of age, with eyes like those of the present patient—"almost out of its head at last," to quote the mother's own words.

Present state.—When seen as an out-patient the child's condition was as under:—

A pallid, wasted baby, weighing nude 10 lbs., affected with lichen urticatus and evidently very ill. No purulent discharge from the eyes. Each cornea is ulcerated. Lies apathetically in mother's arms. Cries feebly when touched. Thrush on palate, etc. R. cornea shows a keratocele in lower-inner quadrant of cornea, surrounded by a sloughy infiltration. About one-third of the left cornea is involved by an ulcer covered with a greyish-white slough. A very small, white, glistening, scaly patch of xerosis lies in the ocular conjunctiva of each eye on the outer side of the cornea. Eserine drops (grs. ii.) thrice a day and the eyes meanwhile to be kept tied up. Cow's milk and meat-juice prescribed.

A week later (June 18th, 1903) the baby's condition was so much worse than she was admitted into the hospital.

Upon admission.—Baby is very white and extremely apathetic, so that attempts to examine the eyes are scarcely resented. R. E. the cornea is sloughing with a keratocele at the lower-inner part. L. E. one-third of the cornea is engaged in a greyish-white slough. T. 99.8° F., and 98.4° F. Eyes to be treated with compressive bandage, hot boric fomentations, and physostigmine (2 grains to the ounce). Generally, milk, lime water, Valentine's meat juice, strychnine, and syrup of the iodide of iron, thirty drops three times a day.

Treatment and Progress.—June 20th.—Weight 10 lbs. June 22nd—T. 98° F. and 101.4° F. Condition of eyes about the same. There is some bronchitis, but no evidence of tubercle can be obtained. June 23rd.—One drachm of brandy three times a day. June 25th.—T. 97.6° F. and 96.6° F. P. 120. R. 32. Child rather better, with a more vigorous cry. Food taken well. Eyes now free from redness and xerotic patches. Adherent leucomata in R. down and in., and in L. below. In each eye part of the pupil is visible. Baby looks as if she might recover. June 26th.—T. 98.4° F. morning and evening. P. 132. R. 32. Weight 10¼ lbs. July 1st.—T. 98° F. and 98.4° F. Weight 11 lbs. Baby taking food well. During the last week there has been a frequent cough. July 2nd.—Neither redness of eyes nor xerotic patches now present. R.E. a small adherent leucoma lower-inner quadrant of cornea. L.E. small adherent leucoma immediately below pupil. The baby has gained three-quarters of a pound since admission to the hospital. Brandy, physostigmine. and boric fomentations to be continued. July 6th.—Child examined by my medical colleague, Dr. George Carpenter, who was kind enough to make the following note: "The infant is obviously rickety. The ribs are markedly beaded, and the long bones are plus. She is a little pale. Has a little bronchitis and probably adenoids (there are post-nasal 'snuffles'). Pot-bellied. Spleen and liver a finger's breath below costal margin. No evidence of tubercle and nothing to suggest tubercle."

July 16th.—Weight 11½ lbs. July 22nd.—General condition of child better. It takes its food well, and is gaining weight. The eyes remain much in the same condition as noted already. July 23rd and July 31st.—Weight 11½ lbs. August 6th.—Weight 11½ lbs. Baby now quite well. Eyes free from redness. with adherent leucomata as noted. Baby discharged. cured, from hospital.

The child, now aged 2½ years, was again seen on April 13th, 1905—i. e., twenty months after her discharge from hospital—on account of phlyctenular conjunctivitis affecting the left eye. She was still a miserable looking child, weighing, naked, only 11 lbs. 4 ozs. There was a small adherent leucoma in the lower nasal quadrant of the right and in the lower fourth of the left cornea. From the position of these leucomata no very serious impairment of sight should be produced.

8.—Crockett, Thomas, 1 year. Admitted August 6th, 1903. Discharged November 17th, 1903.

History.—The child was fed on the breast for three months, and since then on Nestle's milk and barley water. Biscuits and cakes have been given to him at times, but usually "he has not kept them down." One month ago the child had measles, and since then has wasted away and has been fretful. The left eye is stated to have got bad three weeks ago. It appeared to be red, was continually running, and was usually kept closed tightly. It is the fifth child in the family.

On admission.—The baby looks ill, and is badly nourished, weighing 9¼ lbs. R.E. in the centre of the cornea is an epithelial denudation, which stains with fluorescein. L.E. a leucoma adherens lies below the centre of the cornea. A suggestion of xerosis is seen below the leucoma.

Treatment and Progress.—Brandy, one drachm every six hours. Atropine drops twice a day. Both eyes to be kept covered with a pad and bandage. August 24th.—Since admission the child has gained half a pound in weight. He seems vigorous. The temperature kept about normal until the 20th instant, when it rose at night to 100° F. Since then the evening temperatures have been 98.4° F., 102° F., 101.2° F. The recorded temperatures to-day have been 99° F., 97.6° F., 100° F., and 98.2° F. A glandular enlargement is present on the left side of the neck. August 26th.—The temperature since date of last note has still shown a tendency to rise at night to 100° F., 101° F., and once to 102° F. The swelling in the neck is smaller. September 9th.—Although the swelling in the neck is smaller, yet it is now soft and fluctuating. An incision evacuated pus. The baby is gaining weight. Condition of eyes much the same. September 28th.—Since the operation the temperature has kept about normal. The child since admission has gained three-quarters of a pound, and has altogether improved. October 1st.—Atropine to be replaced by yellow ointment, applied last thing at night to the eyes. October 25th.—Child does not gain in weight, being still only 9¼ lbs. Both pupils react to light, the right better than the left. R. E. appears to be normal. L. E. the whole cornea is more or less cloudy, and the leucoma adherens remains as noted. Mist. Ol. Morrhuae c. Ferro, one drachm thrice a day. November 12th, 1903.—The eyes present no signs of inflammation. The lower half of the left pupil is covered by a small adherent leucoma. November 17th, 1903.—Discharged.

Weight.—Successive weights were as follows: 9¼ lbs., 9¼ lbs., 9¼ lbs., 9¾ lbs., 9¾ lbs., 9¾ lbs., 10 lbs., 10 lbs., 10¼ lbs., 10¼ ℔s., 10 lbs., 10¼ ℔s., 10½ ℔s., 10¾ ℔s.

Stools.—Motions varied from 0 to 3 a day. Pulse 144 to 168 per minute, and respirations 32 to 40 a minute.

When seen as an out-patient on November 26th, 1903, the right eye showed no change, while as regards the left, a leucoma adherens was present below the centre of the cornea.

9.—Tofts, Sarah, 8 months. Admitted to Queen's Hospital, June 11th, 1903. Died October 8th, 1903.

Baby born at term. Child fed on cow's milk and barley water, and then with Nestle's milk. Child has always been ailing. Five weeks ago she was vaccinated, and since then has wasted, and, as the mother says, "the eyes got bad through vaccination."

On admission.—The baby is markedly wasted, weighs 9¾ lbs., is feeble, pallid, and looks ill. Bridge of nose slightly depressed. Universal lichen urticatus. Coppery papules about anus. Urine 1010, pale, free from albumen. T. 97.6° F. R.E. a white patch of xerosis lies in the ocular conjunctiva on the inner and the outer side of the cornea, which shows a perforated ulcer. L.E. a yellowish slough (notes say "staphyloma") covers two-thirds of the cornea. Xerotic patches as in right eye. The child was admitted to the hospital, and the treatment prescribed included boric fomentations every four hours, inunctions of mercurial ointment, brandy one drachm every four hours, milk, and Valentine's meat juice.

Progress and treatment.—June 14th.—T. 97° F. and 98° F. June 17th.—"Brown pustules now present both cornea." Weight 9¾ lbs. June 22nd.—General condition better than on admission. Retracted head. Kernig's sign slightly present; T. 97° F. June 25th.—T. 98.4° F. and 98° F. The child, who is much better in herself, has now a vigorous cry. July 1st.—Although the baby has a voracious appetite, she does not seem to be making much progress. However, she has gained 4 ozs. since admission, since her present weight is 10 lbs. T. 98.4° F. No redness of eyes or xerotic patches. Leucoma adherens both eyes. July 6th.—For the following note I am indebted to my medical colleague, Dr. George Carpenter: "This infant has a cluster of cutaneous gummata on the right buttock, and a 'blind boil' on the right loin. The ribs are beaded, but otherwise there is nothing special pointing to rickets. The head is retracted, and if interfered with, it arches its back and its head and heels approximate, although they do not touch. The retraction of the head varies from time to time. Baby is not anaemic. It cried and whined during examination. I did not obtain any evidence of tubercle, and my impression is that it is a syphilitic child. It has marked 'snuffles' and craniotabes. Muscles and bones normal. Nourishment of body might be considerably worse."

July 22nd.—Child does not seem to improve despite the administration of mercury and chalk, of which one grain twice a day was prescribed on July 8th. July 23rd.—One grain of mercury with chalk four times a day. August 3rd.—Weight (10 lbs.) stationary during the last three weeks. August 6th.—Brandy two drachms every four hours. September 1st.—Weight 9½ lbs. The rash is better at times. She suffers from recurrent attacks of boils (? cutaneous gummata). September 16th.—Weight 9 lbs. T. 98° F. and 98.2° F. September 23rd.—Weight 8½ lbs. T. 98° F. and 98.2° F. From September 25th to September 29th the temperature rose on two occasions to

101° F. and 101.4° F., and showed several smaller elevations. September 30th.—T. 97.4° F., 98° F., 98.2° F., and 98° F. The child is much weaker. Weight 8½ lbs. Diarrhoea with offensive stools. Lids of left eye swollen on awaking this morning. October 8th.—General condition became gradually worse, and the baby died in an asthenic state at 6 p. m. to-day. The temperature has been normal or slightly subnormal since the 3rd instant.

Stools.—From the date of admission (June 11th) to July 28th the stools varied from one to three a day. They then increased in number from two to six a day, and this continued without material alteration until the infant's death on October 8th, 1903.

Weights.—Successive weights were: (Admission) 9¾ lbs.; (June 17th) 9¾ lbs.; (June 24th) 9¾ lbs.; (June 30th) 10 lbs.; (July 8th) 10 lbs.; (July 15th) 10 lbs.; (July 22nd) 10 lbs.; (July 29th) 10 lbs.; (August 5th) 9¾ lbs.; (August 12th) 9½ lbs.; (August 19th) 9½ lbs.; (August 26th) 9¾ lbs.; (September 2nd) 9½ lbs.; (September 9th) 9½ lbs.; (September 16th) 9 lbs.; (September 23rd) 8½ lbs.; (September 30th) 8½ lbs.; and (October 7th) 8½ lbs.

Post-Mortem Examination.

Autopsy made twenty hours after death. Rigor mortis present. Body extremely wasted and marantic, with old, wizened appearance of face. No superficial swellings. Heart: small and pale. Lungs: oedema of bases and slight bronchitis; no consolidation. Liver: very full of blood, large, not fibrotic, darkly bile-stained. Spleen and kidneys normal. Mesenteric glands: a few show slight enlargement; no tubercle. Intestines: very shrunken, no ulceration. Brain: marantic, wasted, especially frontal region. Excess of fluid. No trace of meningitis. No tubercle in substance or on surface.

Pathological Examination of the Eyes.

(First Eye.)—The cornea varies much in thickness, and is mainly converted into vascular fibro-nuclear tissue, to the back of which the remains of the iris are wholly adherent. It is covered by an irregular layer of epithelium, the cells of which are more or less uneven, stain badly, and are vacuolated. Particles of pigment, derived from the iris, are present in the thickest parts of the pseudo-cornea. No trace of Bowman's membrane can be made out. Descemet's membrane, in some of the sections, can be found towards the periphery of the anterior chamber. Ciliary body pigmented and atrophied. Peripheral zone of lens markedly vacuolated. Lying upon the anterior pole of the lens, below the capsule, is a small pyramidal mass of laminated tissue, staining almost homogeneously with eosin. Some remains of the anterior capsular epithelium seen between this cataract and the capsule. Sclera, choroid, retina, and optic nerve all show signs of inflammation, as evidenced by distension of vessels and hypernucleation. In certain specimens Descemet's membrane can be recognized towards angle of the anterior chamber, between cornea and iris, with its free end coiled up.

(Second Eye.)—The specimen contains no crystalline lens.

The corneal lamellae, altered in direction, infiltrated with small round cells, and containing blood-vessels, extend from the limbus for a longer or shorter distance into the cornea, and are then replaced by tissue possessing a very remote resemblance to corneal tissue proper. Descemet's membrane could be recognized in places, but no trace of Bowman's membrane was seen. The pseudo-cornea, as it may be called, is covered in front with imbricated and irregular epithelium, and behind by proliferating and hyperplastic uveal pigment, and is made up of round cells, fibres, blood vessels, and pigmented cells. Its central parts, extremely attenuated, consisting of round and pigment cells merely, even the anterior epithelioma being missing in most of the sections examined. The iris, much changed in texture, is adherent to the cornea, and takes part with the latter in forming the pseudo-cornea. The ciliary processes are stretched towards the axis of the globe, while extending across, from one side to the other, is a fibro-cellular exudation of inflammatory products derived from the processes. Ciliary muscle, sub-conjunctival tissue, choroid, retina, and sclera, as far as they could be examined, were infiltrated with small round cells.

10.—Graves, Rossetta, 12 months. Admitted to the Queen's Hospital for Children, London, on March 30th, 1903, and discharged April 24th, 1903.

History.—The patient, who was born towards the end of the eighth month of pregnancy, has been fed upon the breast, with an occasional crust. She is the fifth in the family. One child died at 3½ years from scarlet fever. The others are alive and well.

As a baby she was never strong. For the last seven weeks she has been suffering from "bronchitis," according to her mother's statement, and during her illness discharge has been noticed to run from her eyes and nose. For three or four days she lay in a state of coma-vigil, and a week ago, when her medical attendant opened the lids, he found that her left eye was inflamed. He therefore recommended that she be sent to the hospital. His diagnosis of the case is said to have been "meningitis."

Present state (March 23rd, 1903).—The child (examined in the out-patient department) is white and evidently very ill in herself. She "snuffles," but there is no history of syphilis. There is stiffness of the neck, and Kernig's sign appears to be present.

The right cornea is clear, but the case is very different as regards the left cornea, three-fourths of which is converted into a yellowish, pultaceous mass, evidently representing a sloughing ulceration which has perforated. Through the relatively clear portion of the cornea, which is situated upwards and outwards, it can be seen that the iris has become incorporated with the slough. No xerosis is present.

Progress and Treatment.—Hot boric fomentations and powdered iodoform locally to the left eye.

The child was admitted as an in-patient under my care a week after she was first seen, and on the following day the ulcer of the left cornea was treated with the galvano-cautery. The following report upon the child's general condition was made by my colleague, the late Dr. George Carpenter:

"The child has a large head and widely patent fontanelle, which is flattened and not raised. There is a chronic discharge from the nose, and by digital examination adenoids can be felt. The ends of the long bones are not enlarged nor are the ribs tender, and apart from the potbelly and widely open fontanelle, the child does not appear to be ricketty. The spleen is enlarged, but the liver is no so (two fingers below the ribs). The limbs are short for the trunk. The forearms seem specially short and the leg bones generally. The child has lichen urticatus. She is a little pale but not markedly so. There is some scarring over the left index metacarpo-phalangeal joint, said to be secondary to rubbing her nose when she was ill. The child appears to be of defective intellect. It has no notion of sitting up. It moves its limbs. The condition of the trunk and short limbs is rather like achondroplasia. There is no evidence of syphilis. The child can hold up its head. There are two symmetrical holes on either side of the sagittal suture, about three inches from the lamdoidal suture."

The child was discharged from Hospital on March 30th, 1903, with the ulcer replaced by a partial staphyloma of the left cornea.

On May 21st, 1903, the child attended as an out-patient. She was better in herself. There was a large adherent leucoma of the left cornea. On June 25th, 1903, she attended again. Her color was ghastly, and she was wretchedly thin, weighing only 14 lbs., although she was fifteen months' old. When her eyes were examined, she moaned feebly instead of crying as a more vigorous child would have done. The right eye was normal. The left eye showed a large adherent leucoma.

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11. Carpenter, Frederick, 7 days. Admitted to Evelina Hospital under Dr. Nestor Tirard, on Ocober 17, 1904. Died November 13th, 1904. An eight months' child.

On admission, very jaundiced, but sclera not much affected. Weight, 4¼ lbs. Umbilicus healthy. Heart and lungs healthy. T. 96.2° F. and 97° F. Some little mucopurulent discharge observed from both eyes. A diagnosis was made of syphilitic cirrhosis of the liver. On the following day the left cornea looked steamy, and the iris reacted sluggishly to light. On October 22nd the cornea of that eye appeared to be sloughing. October 22nd.—A lotion containing two grains of the acid hydrochloride of quinine to the ounce of distilled water to be used to the affected eye every four hours. October 24th.—L.E., the whole of the corneal epithelium is shed except for a narrow rim concentric with the limbus. A diagnosis of keratomalacia was made. No micro-organisms could be found either in cover-glass preparations or in tubes of nutrient material inoculated with discharge from the affected eye. October 26th.—Physostigmine drops, gr. 1 to the ounce, to be used three times a day. November 3rd.—Dr. Leathem, pathologist to the Hospital, reports that cocci, in pairs and in small groups, staining with Gram, and that xerosis bacilli were found in smears and in culture tubes inoculated from the affected eye. November 12th.—Eye perforated and allowed lens to escape this day. November 13th.—Baby died suddenly at 1.55 p. m. after a stay in Hospital of twenty-seven days.

From three days after the date of admission until November

11th the baby was kept in an incubator. Weights.—On admission, 4¼ lbs.; October 20th, 4 lbs. 6 ozs.; October 26th, 4 lbs. 6 ozs.; November 2nd, 4¼ lbs.; and November 9th, 4½ lbs. Temperature.—From admission to October 22nd. temperature very irregular, reaching at 6.30 a. m. on the 19th October 105° F. Onwards until death the temperature then was subnormal, except on one occasion when it was normal (98.4° F.), and on two other occasions, when it reached 98.6° F. It is to be noted that the temperature had been below the normal line for the six days immediately preceding death. Respirations.—They ranged from 24 to 48 per minute. Pulse.—100 to 160 per minute. Stools.—The motions varied from 2 to 7 a day after October 18th. On the day of admission and the following day there was no action of the bowels.

Report of post-mortem examination made on November 14th, 1904.—Nutrition poor. Weight, 4 lbs. Rigor mortis absent. Hypostasis slight. Body deeply jaundiced. Keratomalacia of left eye (removed for subsequent examination). Mesenteric glands normal. Liver small, flaccid, very dark in color. Gall bladder contains a small amount dark yellow bile, which can be forced into the duodenum. Spleen normal. Supra-renal bodies large and of dark color. Kidneys normal.

Postscript to the above protocol.—"Sections of liver do not show any definite fibrosis. There are a few very small intercellular collections of small round cells. The smallest bile channels contain bile, but none is seen in the bile ducts in the portal canals. The liver is congested."—A. N. Leathem.

12.—H—— ——, Violet, aged 8 months, attended by out-patient department at the Queen's Hospital for Children on March 16th, 1905.*

History.—The baby was born at term, and then appeared to be healthy. She has been fed upon cow's milk since birth. When aged two months, she began to fall away and to suffer from diarrhoea and vomiting. She attended the hospital as an out-patient from September 15th to October 6th, 1904, and recovered under treatment with calomel, bismuth, and salol. Barley water was prescribed with the cow's milk.

About a month ago the baby again began to waste, and has continued to waste ever since. There has been diarrhoea (four to eight stools a day) but no vomiting. Five days ago (March 11th) the mother noticed "something white" over the baby's eyes, and for four days the baby has lain with her eyes covered by her hands, and has moaned without cessation. She is the first child.

On admission.—A miserable-looking baby, weighing (nude) 9 lbs. 8 ozs. It cries feebly and moans during the whole time it is being examined. There is no redness or swelling of the eyelids, which are kept constantly shut. Although there is no discharge of muco-pus, yet there is a slight running of water from between the palpebral fissures. The eyeballs manifest little redness. Both corneae are converted into greyish-white sloughs, except for a narrow peripheral portion, 1.5 mm. to 2 mm. wide. The limbus is slightly raised, and it forms, as it were, a narrow glistening band which encircles the gangrenous corneae. In addition to the limbal change, there is a small triangular area of dry and greasy-looking xerosis in the ocular conjunctiva on the outer side of each cornea. At the upper and inner part of the right cornea is a small black spot, representing a prolapse of the iris at an early stage.

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*Exhibited on March 17th, 1905, at a meeting of the Society for the Study of Disease in Children.

13.—Ficken, Sarah, 8 months. Admitted Queen's Hospital for Children on March 10th, 1906, and died on March 28th, 1906.

Attended Dr. S. Neave's out-patients on March 10th, 1906, on account of cough, wasting, and conjunctivitis. Admitted to eye ward on same day. The baby had been fed upon Nestle's milk since birth, and for the last two months Ridge's food had been given, in addition to the milk.

On admission.—A marasmic baby, weighing 9 lbs., T. 99° F. R.E.—Slight conjunctivitis with discharge. L.E.—Cornea hazy, with leucoma over lower part.

Treatment and Progress.—March 16th, 1906.—"Nasty ulcer of left cornea. Pus in anterior chamber." March 19th, 1906.—Ulcer larger, and cornea generally hazy. There is still pus in the anterior chamber. An anaesthetic was administered, and the ulcer cauterised with the galvano-cautery. March 22nd, 1906 (baby seen for first time by me).—Base of ulcer is bulging forward, and appears as if about to perforate. The yellow appearance of the lower segment of the cornea has disappeared. Child improving. March 26th, 1906.—Child worse the last two days. Fontanelle and eyes sunken. Motions loose, offensive, white, and pasty. Temperature, previously subnormal, has risen to-day to 90° F. Signs of consolidation of both bases behind. Condition of cornea much as before. March 27th, 1906.—Child much worse. Consolidation of lungs extending. March 28th, 1906.—Child died at 3.35 a. m.

Treatment included boric lotion, argyrol (25 per cent.), dionine (5 per cent.), perchloride lotion (1:6,000), and atropine (grs. 4). Baby fed on milk and lime water, and brandy administered. Internally, adrenaline, strychnine, mercury with chalk, and ipecacuanha were given.

Temperature.—The temperature showed a tendency to rise almost every day to between 100° F. and 101.8° F., and to sink to 97° F. or even a little lower. The elevation occurred sometimes in the morning and sometimes in the evening.

Bowels.—The stools ranged from 1 to 5 per diem.

Weight.—Successive weights were: 9 lbs., 9¼ lbs., and 9½ lbs.

Post-mortem Examination.

External appearance.—Wasted but not extremely thin baby.

Pleurae.—Healthy except over consolidated areas of lungs, where there was a granular appearance.

Lungs.—Consolidation of both lower lobes from confluent broncho-pneumonia.

Bronchial Glands.—Not enlarged.

Mesenteric Glands.—Slightly enlarged, but no evidence of tubercle.

Pericardium—Healthy.

Heart.—Nothing noteworthy.

Abdomen.—A curious mixing up of the large and small intestines presented itself. The greater part of the small intestines were situated in the upper half of the abdomen, but passing into the midst of this was a coil of large intestine. The greater part of the large intestine lay below and to the left. The mixing up of the small and large intestines was due to the fact that all were enclosed in one mesentery and the folding of this mesentery had caused partial volvulus of a portion of the small intestine and large intestine, causing a certain amount of constriction. The attachment of the mesentery ran obliquely from the point of origin of left renal vein to the left sacro-iliac joint. The great omentum came off the lower border of the stomach and passed downwards to transverse colon and ascending colon. On the left it formed part of the covering of the spleen and a fold below it resembling the spleno-colic ligament.

Spleen.—Nothing noteworthy.

Stomach.—Ditto.

Small intestine.—Ditto.

Large intestine.—Constricted about juncture of ascending and transverse colon, where partial twisting had occurred.

Pathological Examination of Eyeball.

The left eyeball was hardened in formol (5%), frozen, and cut into three portions by meridianal incisions. The upper and the lower parts were rejected, and the middle part was divided into an anterior and a posterior segment. After the usual preparations, these were embedded in cellodin, and cut for the microscope.

1.—The anterior segment.—Over most of the lower half of the cornea, Bowman's membrane and the anterior epithelium were missing, or, at the most, traces of the first named could be recognized here and there. This portion of the cornea was ulcerated, and its substantia propria contained masses of small round inflammatory cells. The remainder of the cornea showed oedema and a restricted number of inflammatory cells. Some inflammatory cellular effusion was present towards the angles of the anterior chamber. The iris contained dilated vessels, and many small round inflammatory cells. Its uveal layer was adherent here and there to the anterior capsule of the crystalline lens (posterior synechiae). The meshes of the suspensory ligament were crowded with inflammatory cells, apparently derived from the ciliary body, which manifested evidences of interstitial inflammation. Such cells were also found in the hyaloid membrane.

2.—The posterior segment.—General inflammatory changes.

14.—Raven, Leonard, 11 months. Admitted Evelina Hospital August 8th, 1905, and discharged October 3rd, 1905.

History.—Admitted as an out-patient, under Dr. Whipham, on August 4th, 1905. suffering from diarrhoea and vomiting. Baby said to have been ailing for three weeks. Motions, of normal color, three a day. Weight, 12 lbs. 5 ozs. Corneal ulcer on one eye. The sixth child in family. Born at term. Breast until eight months, and then gravy, potatoes, milk puddings, barley water and milk. Biscuits, bread and butter, and eggs also given. At 10 months, diarrhoea with offensive motions, and wasting.

When the baby was first seen in the ophthalmic department on August 8th, 1905, the following notes were made:

Five days ago, according to the mother's statement, a small speck was noticed on the left eye. No photophobia, lacrymation, or discharge is present; baby seems to have no pain. L.E.: a white swelling is present over the lower part of the cornea, but does not quite reach the sclero-corneal junction. It seems to be solid, and to have increased in concentric rings. Its surface is shiny, and some fine vessels appear to be present under the surface. Pupil contracted. No hypopyon. Marked conjunctival congestion. Muco-purulent discharge.

A diagnosis of keratomalacia was made, and the child taken into the hospital.

Upon admission.—A markedly athrepsic infant, moaning feebly and manifesting a slough covering, roughly, the lower half of the left cornea. Signs of inflammation not well marked. No xerotic patches in either eye. Child examined generally with negative result. White spots on palate and sides of mouth. The latter is red and sore. There are several sores on the buttocks.

Bacteriology.—Blood-agar was inoculated with a scraping from the affected cornea. After incubation, the surface of the medium showed small, translucent, greyish colonies. Films stained from these showed a coccus occurring in pairs and small groups, probably the pneumococcus. The coccus was inoculated into a rabbit. The animal died in about thirty-six hours, and its heart blood was found to be crowded with pneumococci.

Treatment and Progress.—Physostin sulphate, gr. I. to the ounce, to the left eye every three hours. August 14th.—Half an ounce of cod-liver oil to be rubbed into the skin twice a day. August 15th.—Baby has lost one ounce since admission. L.E. entire cornea, except for a peripheral zone ½ mm. to 1 mm. in width, occupied by a bulging slough with protrusion of Descemet's membrane. No patches of xerosis. R.E. unaffected. August 22nd.—A tiny perforation of the left cornea has occurred, and the tension of the eyeball is low. September 1st.—Mist. acidi co, two drachms thrice a day. September 2nd.—The child has gained weight, and her general condition has improved. Child now opens affected eye well and there is no congestion. The pupil is occluded by a bulging leucoma adherens, and the tension is raised. October 3rd.—Child now bright and well, weighing 14½ ℔s. Opens his left eye readily. No redness, discharge, or lacrymation. Tension not raised. The lower three-fourths of the cornea is occupied by an adherent leucoma, which entirely occludes the pupil. The central part of the corneal cicatrix is apparently thinned, and is of a darkish color.

Weight.—Successive weights during the baby's stay in hospital were as follows: (Admission) 12 ℔s. 5 ozs.; (August 15th) 12 lbs. 4 ozs.; (August 22nd) 12 lbs. 12 ozs.; (August 29th) 13 lbs.; (September 5th) 13 lbs. 2 ozs.; (September 12th) 13 lbs. 8 ozs.; (September 19th) 13 lbs. 12 ozs.; (September 26th) 14 lbs. 4 ozs.; (October 3rd) 14 lbs. 8 ozs.

Temperature.—On admission, 99.8° F. and on the following morning 100.4° F. Until August 30th it remained subnormal except on four occasions, the highest point touched being

98.8° F. From August 31st to September 4th the temperature oscillated between 96° F. and 100° F. It then fell to below the normal line, and remained there with insignificant variations until the date of the child's leaving the hospital.

Stools.—The motions varied in number from 1 to 7 a day.

Subsequent Notes Made in the Out-patient Department.

November 28th, 1905.—Weight 22½ lbs. A staphyloma is present involving almost the whole of the left cornea. Tension raised. The child appears to be in some pain with the eye.

15.—Caley, Leonard, 9 months. Admitted to the Queen's Hospital on July 30th, 1906, and discharged on December 21st, 1906. Admitted with keratomalacia (R.E.).

On Admission.—Broncho-pneumonia (double). Some retraction of head. Temperature, 100.2° F. Weight, 10½ lbs. R.E. An ulcer which occupies the greater part of the cornea has perforated and the remainder of the cornea is hazy. Tension low. The ocular conjunctiva has lost its luster, and has a greyish hue. L.E. The ocular conjunctiva as in right eye, but there is no ulceration of the cornea.

Progress and Treatment.—Milk, barley water, and cream. Brandy, m. XXX, every six hours. Physostigmine (gr. 1 to the ounce) to the eyes every six hours. Warm boric acid lotion often. Nasal feeding, as baby takes food badly. August 2nd, 1906.—Child is being fed by mouth to-day. Retraction of head still present. Tubular breathing can be heard in right axilla. Baby lies with properly closed eyelids, which although a little oedematous, are scarcely reddened. He resists examination of his eyes, the condition of which is as follows:—R.E. The greater part of the cornea is occupied by a slough of greyish yellow color, only 2 mm. of the cornea being left intact. The inner half of the slough shows a keratocele. L.E. Not inflamed. Xerosis conjunctiva still present. The lower third of the cornea shows slight dulness and loss of the epithelium. August 9th, 1906.—The upper lid of the right eye is now red and swollen, resembling the condition found in gonorrhoeal ophthalmia. There is chemosis of the ocular conjunctiva. The cornea is clearer than it was, although there is still a slough at some parts of its margin. A darkish body, clearly the crystalline lens, can be seen, when baby struggles, through the valve-like opening that involves the outer periphery of the cornea. L.E.—no external signs of inflammation. A shallow ulcer involves the lower third of the cornea, the rest of which structure is clear. No white line at limbus. Brandy every four hours. Meat juice added to the diet. August 12th, 1906.—Taking food fairly well. Temperature 104.6° F. Tubular breathing heard all over right lung in front. Crepitations on left side and also at right base. August 13th, 1906.—The right cornea has perforated, and allowed the lens to escape. The latter body was found on the pad when dressing the eye. The cornea now presents a more or less circular aperture, with a sharp edge at the point of perforation. August 16th, 1906.—Child is very ill. R.E.—Symptoms are subsiding, and the central parts of the cornea through which lens escaped three days ago are covered by a slough. L.E.—A definite ulceration, some 1.5 mm. in diameter, lies below the center of the cornea. Eyeball is somewhat red. August 28th, 1906.—R.E. swelling and redness of eyelids and protrusion of globe, which is in a condition of panophthalmitis. L.E.—Signs of inflammation not pronounced, although there is a keratocele towards the center of the lower third of the cornea. September 5th, 1906.—Retraction of head still present, and baby's general condition not so good. Although he is taking food well, he has lost 1¼ lbs. during the last fortnight. Scattered over both lungs rhonchi and tubular breathing can be heard. Otorrhoea right side and enlarged preauricular gland. October 3rd, 1906.—Condition of child varies considerably from day to day. Head retraction not constant. Despite the fact that he takes his food well, is losing flesh. R.E.—The shrunken globe now appears as a small yellowish body, of very low tension, with a dark colored central portion. L.E.—The keratocele towards the lower third of the cornea is still present. October 10th, 1906.—Head more retracted. Child, who is restless, screams occasionally. The baby has gained ¼ lb. in weight. October 29th, 1906.—Patient, whose general condition is really bettered, has gained one pound in weight since the 10th instant. Condition of eyes unchanged. November 8th, 1906.—R.E. a shrunken stump. L.E.—The leucoma adherens which is present entirely occludes the pupil. Tension normal. Nurse thinks child cannot see with left eye. As regards himself, the child is doing moderately well. November 15th, 1906.—Iridectomy attempted on left eye. November 28th, 1906.—Condition of child greatly improved.

Successive weights were: 10½ lbs., 10¾ lbs., 11 lbs., 10¾ lbs., 11 lbs., 11 lbs., 11¼ lbs., 10½ lbs., 10 lbs., 10 lbs., 10 lbs., 10¼ lbs., 10¼ lbs., 10½ lbs., 11 lbs., 11¼ lbs., 11 lbs., 11¼ lbs., 11½ lbs., 11¾ lbs., 12 lbs., 12¼ lbs., 12¾ lbs., 12¾ lbs., 13 lbs., (on discharge) 13 lbs.

Bacteriological report.—On August 2nd, 1906, smears and cultures were made from scrapings obtained from the right cornea. In smears a rod-shaped bacillus, Gram-positive, not acid-fast, was present. It had about the size of the Klebs-Löffler organism, but did not show polar staining. After twenty-four hours at 37° C. a pure culture of the same organism was found in the serum tubes There was no growth on the agar tubes at the end of thirty-six hours. The bacillus did not give an acid reaction in neutral bouillon. It was identified as the xerosis bacillus.

16.—Saunders, Charles, aged 14 months. Admitted Queen's Hospital on October 4th, 1906, and discharged January 30th, 1907.

History.—Before this neglected-looking infant had chicken-pox at eleven months he was in good general health and had nothing wrong with his eyes. There has been no vomiting; but he has suffered from diarrhoea for one month.

On Admission.—Weight 12¾ pounds. Neglected sores on occiput. R. E., lids somewhat red and swollen. What appears to be an incomplete congenital coloboma is present towards the free edge of the middle of the upper eyelid. The ocular conjunctiva is reddened. The central region of the cornea is converted into a slough, and is protuberant. L. E., unaffected.

Progress and Treatment.—Milk diet with cream. Brandy, 30 drops every four hours. Cod liver oil and malt. Inunctions of cod liver oil. Boric fomentatons and physostigmine drops (gr. 1) every four hours. October 7th, 1906.—Child now taking its food well. The right cornea is much cleaner, and there is less discharge from the eye. October 11th, 1906.—Child better in every way. The right cornea has not perforated, although the greater part of it is now represented by a keratocele. Medium symptoms of inflammation. No physical signs found in chest or abdomen. October 16th, 1906.—The patient has some bronchitis. October 29th, 1906.—Child has gained nearly one pound since admission to hospital. The bronchitis is better, and he takes food well. Hydrogen peroxide to eye ter die. General condition of child satisfactory. Child opens his right eye, of which there is no redness. Coloboma of lid, of course, present.

Successive weights were—(admission) 12½ ℔s.; 12¾ ℔s.; 13 ℔s.; 13¼ ℔s.; 13½ ℔s.; 13¾ ℔s.; 14 ℔s.; 14½ ℔s.; 14¾ ℔s.; 15¼ ℔s.; 15¾ ℔s.; 16¼ ℔s.; and on discharge 16¾ ℔s.

17.—Thomas, Estella, 7 months. Admitted to Queen's Hospital for Children on June 7th, 1906, and discharged September 3rd, 1906.

Estella is the seventh child. She was healthy until six weeks ago, when she was put upon the bottle. Since then "she has fallen away" There has been neither diarrhoea nor vomiting.

About three weeks ago both upper lids began to swell, and a fortnight ago, a whitish appearance of both eyes was noticed.

Two of the children of the family have died from diarrhoea and vomiting.

On Admission.—Eyes examined under chloroform: R. E., no redness of eye. A creamy patch of xerosis lies in the ocular conjunctiva below and to the outer side of the cornea. A small area having a similar appearance lies just below the centre of the cornea. L. E., slight redness of eyeball. An ulcer, which is on the point of perforating, lies over the centre of the cornea. There is a plaque of epithelial xerosis in the ocular conjunctiva on the outer aspect of the cornea.

Although the child is very feeble, there are no definite physical signs in chest or abdomen. Weight, 10¼ ℔s. Temperature, 97° F.

Progress and Treatment.—Baby placed upon milk, lime water and cream. Raw meat juice also given. Brandy, m. XV., every four hours. Locally, quinine lotion (grs. 4 to the ounce) kept applied on pads to the eyes, and physostigmine (grs. 2 to the ounce) dropped into the eyes every four hours. June 14th, 1906. —The left cornea has perforated. Inunctions of neat's-foot oil. Weight 10½ ℔s. June 20th, 1906.—Fine crepitations heard all over chest, most marked over right lower lobe. No enlarged glands can be felt in abdomen, neither can the liver nor spleen be palpated. Weight 10½ ℔s. July 26th, 1906.—The child, who now weighs 10½ ℔s., seems better in herself. She rolls her eyes about aimlessly, and is evidently blind. R. E., the pupil is occluded by an adherent leucoma, which covers the central parts of the cornea. L. E., the orbit is occupied by a shrunken stump. August 2nd, 1906.—Harsh breathing over both lungs, but most marked over upper lobes. The apex of the right upper lobe is dull and breathing over this area is of a somewhat tubular character, especially behind. Some enlarged glands can be felt in the right iliac fossa. The child, believed by the nurse in charge of the ward to be quite blind, is taking her food well, and has improved in general health. Weight 10½ ℔s. August 16th, 1906.—Breath sounds rather harsh all over lungs, together with an occasional rhonchus. A few slightly enlarged glands in the neck. Weight 11 ℔s.

18.—The patient, a male, Francis Jones, aged seven weeks, was admitted on Oct. 11th, 1906, and died on the 22nd.

He was the youngest of eight children, of whom four survived; there has been two miscarriages in addition. The infant, who was born at term, remained well until he was five weeks old, when he began to waste, "snuffled," and developed a rash upon the face and buttocks.

On Admission.—He was found to be a miserable-looking "snuffling" infant, and weighed (nude) 8½ ℔s. There were extensive copper-colored rashes and superficial ulcerations on the buttocks, thighs, face and angles of the mouth. The right eye showed merely a slight inflammation of the conjunctiva, such as is not infrequently present in syphilitic babies during the eruptive stage. The left cornea, however, was covered with an ash-grey slough, through the lower part of which a protrusion of Descemet's membrane (keratocele) could be recognized. On Oct. 18th the right cornea was affected, and it was noted as an unusual feature of the case that dry, white patches of xerosis, were present upon the conjunctiva of both upper and lower lids. The baby, who had the hoarse and raucous cry characteristic of a syphilitic infant, was extremely ill, although the skin eruptions were fading and the cutaneous ulcerations were healing. On the 19th the right cornea looked as if it had been cauterized with silver nitrate—it was of ashen hue, with an irregular and gibbous surface. The child died on the 22nd. No autopsy.

Treponemata were found in scrapings from both the corneae, taken on several different occasions.

19.—William Chandler, aged nine months, was admitted on Feb. 7th, 1907, and was discharged on April 5th.

The left eye was stated to have been bad for one month. The signs of congenital syphilis included frontal bosses, "snuffles," depressed bridge of nose, and a subcutaneous gumma of one thigh. A sloughy and unhealthy-looking ulcer of large size occupied the central parts of the left cornea, but no marked reaction, such as redness or watering of the eye, was present. The child opens the eye well. He weighed 10½ pounds. On Feb. 14th the notes stated that towards the centre of the lower third of the left cornea was a small ulceration, through which Descemet's membrane protruded when the baby cried. Symptoms of inflammation were not at all pronounced. The child has improved in general health. On the 21st the child's general condition was better and the corneal ulcer was healing. On March 14th the left cornea showed a leucoma, to which the iris was adherent, in its lower third, and a small anterior pyramidal cataract was likewise present. The child was discharged on April 5th, and he then weighed 11¾ pounds.

On Feb. 13th, under chloroform, scrapings were taken from the left cornea and were handed over to Dr. W. A. Milligan, pathologist to the Hospital, for examination. Dr. Milligan reported: "Film stained by Giemsa. There are to be seen delicate screw-like rods resembling the spirochaeta pallida." The observation was repeated on the 21st. Similar results were obtained independently by myself.

20.—This patient was an infant, aged three months, in whom the syphilitic manifestations included athrepsia, coryza, slight enlargement of the spleen and liver, and a few small ulcerated papules about the anus. The corneae were practically destroyed and the eyes were in a condition of incipient panophthalmitis when the baby was seen by me. The treponema pallidum was found in scrapings from the diseased corneae. A microscopical field could seldom be examined without coming across one or more of the micro-organisms.

21.—Joseph Wood, aged 3 months, was admitted on July 11th. 1907, and died on the 28th.

The family history showed that three children were born dead, one at seven, one at eight, and one at nine months. The fourth baby, a girl, wasted from the first, and both eyes were affected, probably with ophthalmia neonatorum, on the fourth day. She died when four months old.

The personal history of the patient was as follows:—He was born "a fine baby," but had wasted since he was three weeks old. He had been subject to vomiting after his bottle for the previous three weeks. There had been no diarrhoea. It had been noticed by the mother that the boy's eyes had been inflamed for five days and that for two days "a white film" had formed over the left eye.

When admitted the child was wasted, cried continually, and "snuffled" loudly. His weight was 7½ pounds and his temperature was 97.6° F. There were ulcerated condylomata around the anus. The umbilicus showed a dry, ulcerated surface overlying a thickened mass, probably a gumma. The spleen and liver were palpable. The infant was jaundiced. There was a sanious watery discharge from both eyes, especially from the right. An examination under chloroform showed that the corneae were surrounded by a glistening ring of xerosis, slightly wider at the inner and outer side than elsewhere. Again, the ocular conjunctiva was of characteristic silvery appearance, was dry, wrinkled, and could be readily pinched up. The right cornea was tolerably clear except for a purulent infiltration in its upper-inner quadrant. A large part of the left cornea was occupied by a purulent focus, made up of two divisions—a larger one below and to the inner side, and a smaller one to the outer side at a somewhat higher level. None of the cornea was clear. There was no swelling of the lids or other evidence of inflammatory reaction.

On July 18th the right cornea was occupied by a greyish-yellow slough and there was a bulging dark spot in the lower-outer quadrant representing a keratocele. The left cornea was in a similar but even more desperate condition. Evidences of inflammatory reaction were conspicuous by their absence. The navel had healed. The general condition of the child had not improved. He weighed 7¼ lbs. On the 26th the baby had developed a well-marked papular eruption of a dull-red colour over the body and limbs. The papules averaged one-eighth of an inch in diameter. He took food badly, "snuffled" and was getting weaker. He died from exhaustion on the 28th. No necropsy was held.

On July 12th Dr. Milligan reported staphylococcus pyogenes albus in a tube of agar-agar smeared with secretion from one cornea. On the 14th an examination of smears from the spirochaeta pallida reported negative. On the 25th, however, staphylococcus albus on agar-agar and spirochaetae were found in smears treated by the Giemsa plan.

22.—Mapham, Frederick, 9 months. Admitted Kensington General Hospital on May 14th, 1907, and died May 24th, 1907.

History.—The child was suddenly taken ill on May 14th with blueness, fixation of the eyes and (?) convulsions. He then vomited several times. He was brought to the Hospital, where he was admitted under Dr. George Herschell.

On Admission.—A thin child, rather collapsed. T. 103° F. P. 160. Breathing rapid. A diagnosis of broncho-pneumonia at the left base was made.

Progress and Treatment.—May 16th, 1907.—Discharge from eyes, ears and nose. May 17th, 1907.—Broncho-pneumonia right apex behind and also right base. May 18th, 1907.—Child examined for the first time by me. There was a good deal of mucopurulent discharge from the eyes, but no ulceration of the cornea. May 22nd, 1907.—The general condition of the child is serious. The eyelids are kept properly closed. Both corneae have perforated, and the iris has prolapsed. In the right eye the perforation is in the lower third of the cornea, and in the left eye at the lower-inner quadrant. There is pus in the anterior chamber of the left eye. Signs of inflammatory reaction are slight. T. 103.8° F. P. 168. May 23rd, 1907.—T. (night) 106° F. Respirations, 76. Pulse scarcely countable. May 24th, 1907.—Since the 22nd the child has been more or less unconscious, with semi-closed eyelids, but it is to be noted that prior to the date mentioned the lids were kept closed. T. 107° F. Child died at 4 o'clock p. m.

Bacteriological Report.—On May 23rd, 1907—that is, the day before death—agar-agar and blood-serum tubes were inoculated from the material which covered the ulcer of the left cornea. The greater part of the growth on agar-agar was composed of staphylococcus albus and aureus. But intimately mixed with these in small number was a small and short bacillus, which resembled Hoffmann's bacillus, but which it was impossible to obtain in pure culture. On the blood-serum the proportions of the various colonies were different from those on the agar-agar, but the component micro-organisms were the same.

Post-mortem Examination (made on May 25th, 1907.)—The left pleura contained slightly blood-stained effusion and flaky lymph. Broncho-pneumonia at the left base. Exudation almost purulent. No breaking down. Small patches of broncho-pneumonia dotted through rest of lung. Right base earlier broncho-pneumonia. Small abscess about an eighth inch in diameter, in middle lobe. No caseation of bronchial glands. No evidence of meningitis. Abdominal viscera normal. Some milkiness in arachnoid around optic chiasma.

23.—Boyd, Elizabeth. 5 weeks. Admitted to Queen's Hospital for Children on June 3rd, 1907. Died June 5th, 1907.

Admitted on account of keratomalcia of the right eye.

Present Condition.—Weight, 5½ lbs. Temperature, 96° F. The left cornea is opaque and grey, but symptoms of inflammation, as redness, almost absent. The affected eyeball looked shrunken.

History.—The eye has been noticed to be bad for a week. Four other children (three stillborn). Patient affected with extreme marasmus.

Treatment.—Physostigmine, grs. 2, three times a day. Boric cleansings. Mercury ointment, half a drachm, for inunction once a day. On the day of death (June 5th) 10 drops of brandy every two hours prescribed.

Post-mortem Examination.—Pneumonic consolidation of lower lobe left lung and of lower and middle lobes of right lung. Kidneys very pale. Other organs normal. No evidence either of tubercle or of syphilis.

24.—Grizzle, Florence E., aged 9 months. Admitted to the Evelina Hospital on July 7th, 1908, and discharged on July 21st, 1908.

History.—No family history of phthisis pulmonalis. The eyes stated to have been bad and to have "stuck in the morning" during the last ten days.

On Admission.—This miserable wasted infant weighs 8 lbs. 11 ozs. Her temperature is 100° F. There are a few sores about her anus, together with evidences of a recent papular eruption, but the manifestations are not definitely syphilitic in type. The breath-sounds are rather faint at the base of the left lung, where tubular breathing can be heard. There is a discharge from both ears.

Eyes.—Externally, no marked signs of anything like serious inflammation of the deeper parts of the eye. The right cornea, however, is replaced by a greyish-white slough, through the upper temporal quadrant of which peeps a small protrusion of Descemet's membrane (keratocele). No xerosis conjunctivae. No particular redness of eyeball. The left cornea is represented by a yellowish-white slough. Two dark-hued keratoceles are present—one at the inner and the other at the outer end of the horizontal meridian of the cornea. No xerosis of the conjunctiva.

Treatment and Progress.—Child fed on milk and barley water (equal parts). Ten drops of brandy were given every four hours. Physostigmine sulphate drops (gr. 1 to the ounce) applied to each eye three times a day. The eyes were kept clean with hot saline lotion (1.4 per cent.).

July 10th, 1908.—Left eyeball not reddened, and cornea much as noted July 14th, 1908.—Weight, 8 lbs. 8 ozs. General condition worse. As regards eyes, reactional signs but slight. The lower third of the right cornea is sloughy, while its upper two-thirds are protuberant. There is keratectasia of the left cornea, especially affecting the upper and lower part of the latter. July 21st, 1908.—Has improved in general condition since last note, and child now weighs 8 lbs. 11 ozs. Discharged.

Child seen as an out-patient on August 8th, 1908, and found to be decidedly better in her general health. She had four teeth. There was globular keratectasia of the right cornea, while the left eyeball was shrunken.

Bacteriological Examination.—On admission, scrapings were taken from the left cornea (which was in a pultaceous state) and smeared upon the surface of several cover-slips, which were then stained with methylene blue and with Gram and eosin. Numerous micro-organisms were present. There were cocci, diplococci, and short chains in the various specimens examined. Clearly, most of them were pneumococci, as shown by the lanceolate shape of the diplococci, the well-marked capsulation, and by the fact that they stained deeply with Gram. On agar and blood-serum a coccus was isolated, which appeared to be the pneumococcus, and after a longer stay in the incubator, aspergillus fumigatus developed. At a later period cultures were made from the right eye, and on this occasion the xerosis bacillus, along with a coccus, was obtained. The coccus was a streptobacillus growing in short chains, and Gram-positive. Broth is rendered turbid in twenty-four hours. Litmus milk is turned acid and firmly coagulated in forty-eight hours. On agar there is a much greater tendency for the colonies to become confluent than is seen in streptococcus longus. The cocci grow well on gelatine at a temperature of 20° C., without producing any liquifaction of the medium. Glucose salicin and lactose were fermented, with the production of acid, but not of gas. Mannite was unchanged.

25.—Turner, Caroline. 1 year and 8 months. Admitted to Queen's Hospital on September 10th, 1908, and discharged October 14th, 1908.

Admitted for xerosis conjunctivae and potential keratomalacia.

Family History.—Four other children, all well. The mother suffers from "bronchitis" and is very short of breath, and her voice is hoarse. No specific history could be elicited.

Personal History.—Bronchitis when aged one year. The child has been ill for one week—will not take her food, is always crying, is wasting, and her bowels are irregular. The eyes have been noticed to discharge for one week.

On Admission.—A flabby, wasted child, with wrinkled and inelastic skin. Complexion sallow and muddy. General condition apathetic; does not resent examination or interference in any way. Eyes sunken. The still open anterior fontanelle is depressed. Head bossy, square, and very large. Forehead overhangs face. Moist sounds at bases of both lungs. Edges of eyelids sore, especially at the outer canthi, where the scaly condition characteristic of diplobacillary infection is present. No marked redness of eyes, photophobia, or lacrymation. Ocular conjunctiva all round corneal margin and over a triangular area on either side of the cornea in both eyes is sticky, wrinkled, and devoid of its normal glistening appearance. Both corneae are dull, especially in the lower part of the outer quadrants. The opacity is slight and apparently superficial, and due to changes in the epithelium. When fluorescein is dropped into the eyes, the nasal side of the right cornea stains readily, while there is only a slight diffuse hazy staining over the centre and lower half of the left cornea. There is a slight sticky discharge in both conjunctival sacs.

Progress.—September 26th, 1908.—Child very much better. She is much more lively. Both corneae are clear, and the conjunctiva is now practically free from xerotic changes. October 14th, 1908.—Conjunctiva and corneae now free from morbid changes.

Successive weights were 14½ lbs., 15 lbs., 15½ lbs., 28 lbs.

Bacteriological Examination.—Diplobacilli (Morax-Axenfeld) in smears from conjunctival sac and in cultures on blood-agar.

26.—Reredon, Bertha, eight months. First attendance as an out-patient at the Queen's Hospital for Children, September 23rd, 1909. Admitted to Hospital on October 7th, 1909, and discharged on January 25th, 1910.

When seen in the out-patient department this child appeared to be suffering from acute infective conjunctivitis of the Koch-Weeks' type, and very slight dulness of the left cornea. The cause of the dulness of the cornea was not apparent to me. Ordinary treatment was prescribed.

The history of the case was that the baby had suffered from whooping cough 3½ months ago and from measles 3 weeks ago. The whooping cough was followed by bronchitis, which lasted for about a month. The child's eye was said to have become bad after the whooping cough and bronchitis, and to have got worse since the measles. Patient is the youngest of eight children.

Patient again attended out-patient department on September 30th, but no note was made by the R. M. O. who saw the case.

On October 7th she again attended, and I examined the condition myself. The left cornea was then sloughing and presented a keratocele towards its centre. The condition of the eye was most serious. The child was accordingly admitted to Mary Ward. She was in an extremely septic state, and her vitality was very low.

October 14th, 1909.—Left cornea has perforated towards the inner end of the horizontal meridian and a flesh-colored granuloma, which probably arises from the iris, plugs the perforation in the cornea. The right eye shows less discharge. Case has been treated with physostigmine.

October 21st, 1909.—General condition of child better than a week ago. Less conjunctival injection. Prolapse of iris not increased in size.

October 25th, 1909.—State of left cornea, as well as general condition of child, continues to improve.

October 28th, 1909.—Left cornea the seat of a leucoma adherens No clear and unaffected tissue.

Bacteriology.—In scrapings from cornea were found: (1) pneumococci; and (2) m. catarrhalis.

Treatment.—Hot saline often, physostigmine (grs. 2) t. d. Eye bandaged. Brandy, 10 m. every four hours.

February 10th, 1910 (seen as an out-patient). The left cornea is staphylomatous. The eyeball is of a dusky-red colour. Tension low.

27.—Langley, Ellen, 10 months. Admitted Queen's Hospital for Children on September 28th, 1909, and died October 8th, 1909. O. P. number, 3784.

This was a case of "zymotic diarrhoea," the temperature being a good deal raised practically during the whole time she was in Hospital.

The child was under the care of my colleague, Dr. Sheffield Neave, and on her first attendance as an out-patient the following notes were made under date of September 21st, 1909:—

"Diarrhoea 4 days. Retches, but brings nothing up. Breast-fed every 2 hours. Bowels open every time has breast. Green, watery, and offensive motions. Prolapse. Skin inelastic. No teeth. Fontanelle very patent. Eyes sunken."

When attending the Hospital as an out-patient, the left eye became affected, then she was admitted to the ophthalmic ward on September 28th, 1909.

On Admission.—A wasted child. The left eye shows a sloughing ulcer, which involves, roughly, the lower third of the cornea.

Death on October 8th, 1909. No autopsy.

28.—Knell, Alfred, 6 months. Admitted to the Evelina Hospital under Dr. T. R. C. Whipham on September 2nd, 1909.

Family History.—Eleven children in family, six of whom are dead, one from "wasting." One miscarriage at the third month.

Personal History.—Full time after normal labour. Breast-fed. No other ailments. Diarrhoea for a fortnight, and getting thinner since then. Mother says child has had considerable abdominal pain. Sleeps badly, and cries a great deal.

On Admission.—A fairly nourished child. Eyes not sunken, and expression almost animated. Skin inelastic. Lies comfortably in bed, but keeps legs drawn up. Cries when abdomen is touched. No physical signs of disease in chest. Spleen enlarged.

Treatment and Progress.—October 15th, 1909.—A week ago two large red swellings appeared on the scalp. These soon burst and discharged a considerable amount of pus. Bare bone was seen at the bottom of the cavities. The temperature rose with the abscesses but gradually fell when they evacuated themselves.

October 19th, 1909.—Something amiss noticed with the right eye.

October 23rd, 1909.—Patient examined by me for the first time. No redness or swelling of the lids R. E.—no redness or blepharospasm. The centre of the cornea is occupied by a keratocele, to which the iris is not adherent. Rest of cornea shows no obvious changes. Child very placid, resenting but little attempts to examine the eye. General condition of child miserable. An atypical case of keratomalacia. Physostigmine sulphate, gr. 1, t. d. Bandage. Eye to be kept clean with saline, 1.4 per cent.

Bacteriological Report.—Scrapings from keratocele, or rather from the small slough which was attached to its anterior surface, smeared on cover-glasses and inoculated into agar (old and more or less dry). In the smears organisms that appeared to be pneumococci. On the agar, sarcinae and s. p. albus (Leathem).

November 2nd, 1909.—Both the general and the ocular condition considerably bettered. R. E.—No redness. Opens eye freely. Keratocele is now replaced by a shield-shaped leucoma, to which the iris is non-adherent, which covers practically the entire pupillary area of the cornea. L. E.—has never been affected.

Remarks.—Baby believed to be syphilitic on account of family history and abscesses in scalp. He also suffered from diarrhoea and vomiting, and when eye got involved, was a pretty miserable specimen. Eye improved along with general health. Diagnosis on admission—"wasting." Mercury with chalk, gr. 1, t. d., commenced on September 12th, and increased to grs. 3, t. d. on the 15th.

29.—Barton, Gladys, 11 months. Admitted July 13th, 1909, and discharged October 11th, 1909.

History.—Both eyes have been "discharging" for about three weeks. They have been red and slightly swollen for a few days. On the 12th instant the mother observed a curious black speck in the left eye, and on that account took the baby to Moorfields. The child was referred to the Queen's Hospital from Moorfields as supposed to be suffering from diarrhoea and vomiting.

On Admission.—Slight discharge from both eyes. Slight photophobia. No redness. There is a perforation in the lower-inner quadrant of the left cornea, with prolapse of the iris through the aperture. The remainder of the cornea is clear.

Progress and Treatment.—July 17th, 1909.—A gutter-shaped ulcer has suddenly appeared in the lower half of the right cornea. It is of some considerable depth, but is not infiltrated. There is no redness of the eye. The rest of the cornea is slightly hazy. July 18th, 1910.—Now some redness of both eyes. The ocular conjunctiva lies in folds. The gutter-shaped ulcer is spreading along the lower fourth of the right cornea, and is associated with a yellowish flaky deposit of pus in the anterior chamber. July 22nd., 1909.—R. E. The condition bears a closer resemblance to ulcus serpens in the adult than anything I have ever seen in a child before. Thus, the lower fourth of the cornea is occupied by a trench-like ulcer, of which the lower edge is rounded off, while the upper one is overhung with epithelium and is purulent. The remainder of the cornea is slightly hazy, probably from chemotaxis. L. E.—A leucoma adherens is present in the lower part of the cornea. The aggressive edge of the ulcer of the right cornea was treated with the galvano-cautery. July 24th, 1909.—The ulcer of the right cornea has perforated towards its outer end, and the iris has prolapsed into the aperture. Hypopyon has disappeared. Pupil drawn towards perforation. Rest of cornea clear. There is still some inflammatory redness and ciliary injection. July 26th, 1909.—Protrusion of iris greater in the right than in the left eye. Child very constipated. Her urine is thick, offensive, and contains pus. July 31st, 1909.—Child much better. Bowels open, and urine almost clear and not so offensive. The eyes show no redness. Each cornea is now clear and exhibits only a semi-transparent adherent leucoma in the positions already mentioned.

An iridectomy was performed upon each eye in August and September, 1909, and the child was discharged, apparently seeing well, on October 11th, 1909.

The treatment included argyrol (15 per cent), physostigmine (gr. 1 to the ounce), iodoform, oxycanide lotion (1 : 5000), and saline lotion (1.4 per cent).

Bacteriological Examination.—On July 22nd, 1909, material taken from beneath the ledge of epithelium in the right cornea, was smeared upon the surface of several cover-glasses. These, when stained, showed many tiny cocci and diplococci, some of which were capsulated. The micro-organisms were Gram-positive. It was almost certainly the diplococcus lanceolatus (pneumococcus). No culture, however, was obtained upon agar-agar or blood-serum.

30.—Shackleton, Beatrice, six weeks. Admitted to the Queen's Hospital on August 15th, 1910.

History.—The fourth child, born at term after a natural labour in Queen Charlotte's Hospital, London, on July 7th, 1910. No miscarriages. Weight, 6 lbs. 3¼ ozs. At birth no discharge was noticed from the baby's eyes, but the left eye began to discharge on the eighth and the right eye on the twenty-second day after birth. The symptoms of inflammation were not marked, and gonococci could not be found in secretion from the eyes. There was a return of conjunctivitis, of a very trivial nature, and on August 12th, when I first examined the patient, the right cornea showed a trench-like ulcer in its lower third. There was a little muco-purulent discharge from the eyes, but symptoms of actual inflammation on the part of the conjunctiva were almost non-existent. At the same time micro-organisms that appeared to be gonococci were found in cover-slips smeared with conjunctival secretion (see bacteriological report). The aspect of the case, taken in conjunction with the withered appearance of the baby, was more suggestive of keratomalacia than of gonorrhoeal ophthalmia with corneal complications.

Baby sent for admission to the Queen's Hospital for Children.

On Admission.—Weight, 7 lbs. 13 ozs. The trunk is well-covered, but the arms and legs, more especially the latter, are inclined to be wasted. Temperature 99.4° F. Baby takes food well and has a strong cry. Heart, lungs and abdomen normal. The eyelids are slightly red and swollen. There is discharge from the eyes. The conjunctiva is slightly reddened. Both corneae are affected. The right cornea has perforated in its lower third, and the perforation is occupied by a small prolapse of the iris. A glistening ring of xerosis encircles the lower third of the limbus. The lower half of the left cornea is occupied by a large infiltrated ulcer.

Treatment and Progress.—Physostigmine and hot saline to eyes, together with disinfection twice a day with "perhydrol." August 18th, 1910.—The signs of conjunctivitis are not pronounced, and are certainly nothing like those present in an ordinary case of ophthalmia neonatorum (gonococcal). The lower third of the right cornea shows a large prolapse of the iris, which is surrounded by a zone of infiltrated cornea. The lower two-thirds of the left cornea is occupied by a septic ulcer, the floor of which is of unequal depth. Annular xerosis of right eye, as noted. August 19th, 1910.—Weight, 8 lbs. 2 ozs. August 23rd, 1910.—Discharge from eyes less. The right cornea much in same condition as already noted. The left cornea, however, shows signs of impending perforation. August 24th, 1910.—Prolapse of iris in left eye. August 25th, 1910.—Eyes examined under chloroform. The right cornea shows a cicatrised perforation in its lower third to which iris is totally adherent. The left cornea has also perforated and is in process of healing. Hardly any symptoms of conjunctivitis are present. General condition has improved. Weight, 8 lbs. 8 ozs. No diarrhoea (stools 2 to 3 daily). No broncho-pneumonia. September 1st, 1910.—Baby in good condition, weighing 9 lbs. She opens her eyes, which present no obvious signs of inflammation. Both corneae have now healed with the production of an adherent leucoma. The prolapsed iris noted as present in the right corneae on August 18th has levelled down. No xerosis.

Bacteriological Report.—1. Specimens taken whilst baby was an inmate of Queen Charlotte's Hospital (from conjunctiva).—Films show Gram-negative intra- and extra-cellular diplococci in fairly large numbers, resembling the gonococcus in shape and size. The stain with Pappenheim is characteristic of the same organism. On blood agar, cultures were obtained from a Gram-negative diplococcus. The cultures, which were pure, were those of a slowly-growing but typical gonococcus. 2. Specimens taken direct from the cornea on August 15th, 1910, after admission to the Queen's Hospital. Report by Dr. A. W. G. Woodforde, pathologist to the Hospital.—Films show the same organism as that found at Queen Charlotte's Hospital, but in smaller numbers. On agar a few colonies were obtained of a large Gram-positive bacillus. On blood-agar, there were a few colonies of the same Gram-positive bacillus, and also of a Gram-negative diplococus, showing numerous giant forms. The latter colonies were typical of gonococci. The Gram-negative diplococcus was transplanted on ordinary agar, where it grew feebly. A second subculture showed no growth at all.

31.—Carslake, Rose, 8 months. Attended Evelina Hospital for first time on November 2nd, 1909.

Diagnosis.—Keratomalacia (R. E.).

History.—Third child. Always bottle-fed. Lately, the mixture has consisted of equal parts of boiled milk and barley water.

Three weeks ago child was attacked by bronchitis, and was attended by a dispensary doctor. On October 26th last the baby's eyes were noticed to be bloodshot and to discharge yellow matter. Lotion was prescribed by the medical man in attendance upon the case. This morning (November 2nd) condition of eyes such that the child was sent straightway to the Hospital.

Present State.—The baby looks ill, moans feebly, and is somewhat wasted. The eyes can be half opened. The lids are perhaps a trifle reddened, and may be a little oedematous. There is a certain amount of muco-purulent discharge from the conjunctiva, which nevertheless is not markedly injected. R. E.—The cornea is surrounded by a slightly raised, narrow, white line of xerosis, but the ocular conjunctiva shows no change. The lower third of the cornea is occupied by a purulent ulcer which has perforated and allowed the iris to prolapse. L. E.—The lower-inner quadrant of the cornea is the seat of a purulent ulceration. and the adjacent parts of the limbus show a semi-circular line of xerosis, similar to that described as present in the case of the right eye.

The baby was sent to the Queen's Hospital for admission under my care. She remained in that institution from November 2nd, 1909, until January 31st, 1910.

Treatment and Progress.—Upon admission, the child was placed upon a suitable milk diet, hot boric fomentations were applied to the lids, and physostigmine (grs. 2 to the ounce) was dropped into the eyes three times a day. Brandy was given. November 3rd, 1909.—No discharge from eyes. Slight photophobia. Eyelids very slightly swollen. Trivial injection of eyeballs. Situated along the inner and outer edge of each cornea is a thin, white, elevated line, like the crest of a wave. The right cornea is generally hazy, and a perforated purulent ulcer lies in the lower nasal quadrant of the cornea. As regards the left cornea, a shallow purulent ulcer, of kidney-bean shape, lies below the pupil in the lower nasal quadrant of the cornea. The eyes can be examined without any particular resistance on the part of the child, who is ill-nourished and weakly. November 7th, 1909.—Xerosis is present of both eyes at the inner and outer side of each cornea. The right cornea is prominent, and the eye injected. The ulcer of the left eye is somewhat larger, and hypopyon is present. November 10th, 1909.—There is now marked congestion of each eyeball. The hypopyon noted as being present in the anterior chamber of the left eye is rather less profuse. November 18th, 1909.—Five-sixths of the cornea is now covered with a greyish-yellow slough, probably in connection with the prolapsed iris. L. E.—Pupil well contracted by physostigmine. An extensive but shallow ulcer occupies the lower-inner quadrant of the cornea. Condition of baby grave. Since the 12th instant the temperature has ranged from 100° F. to 103° F., and has touched normal only on two occasions, although taken three times a day; there have been from four to nine stools a day; the respirations have varied from thirty to sixty, and the pulse from 120 to 172 per minute. November 25th, 1909.—The ulcer of the left cornea has practically healed. December 16th, 1909.—The baby is now well on the way to general recovery. She has gained five ounces during the last two weeks. The right eye is shrunken, a little clear cornea only remaining. The left eye shows an adherent leucoma in the lower nasal quadrant of the cornea. No redness of eye. Baby opens eye of own accord, and is stated to recognize her bottle at a distance of about a yard. January 13th, 1910.—Under chloroform, iridectomy performed inwards upon the left eye, a considerable piece of the iris being got away. January 25th, 1910.—Left eye in excellent condition, and results of operation satisfactory.

Whilst in Hospital successive weights were:—10 ℔s. 14 ozs., 10 ℔s. 7 ozs., 10 ℔s. 14 ozs., 10 ℔s. 12 ozs. and 11 ℔s. 14 ozs.

Result.—This child was seen in the out-patient department on February 3rd, 1910, when her condition was as under: weight, 200 ozs.; general condition, fair. R. E. shrunken. L. E. leucoma adherens, with good iridectomy coloboma up and in.

Bacteriological Report.—Cover-glasses smeared with material from the ulcerated cornea were submitted to the Hospital pathologist, who reported that gonococci and xerosis bacilli were present. Apparently, however, no cultures were made or attempted.

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HEMICHOREA, HEMIATAXIA, HEMIPARESIS AND DILATED PUPIL, PROBABLY DUE TO A LESION NEAR THE NUCLEUS RUBER.

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Mrs. C., a widow, aged 51 years, was first seen by me on November 23, 1909, having been referred by Dr. M. S. Mengel of Elverson, Pa., and Dr. John Wells, Chester Springs, Pa. About six months and a half before coming under observation, she had a seizure which left her somewhat incapacitated or paralyzed on her right side, arm and leg. The attack came on while she was walking around. She first had an unnatural feeling in her right arm, then in her leg, and both members gradually got so that she could not use them properly. Speech was not affected. She was not unconscious at any time. For several weeks previous to the apoplectiform seizure she had had at times a swimming or giddy sensation, and had also a little headache above the left eye, and ever since she has continued to have some pain in this region.

It was evident at first sight that her arm was the seat of a continuous tremor which increased when she used it.† The tremor was of a moderately coarse type. The oscillating hand was held slightly flexed and some movement was present in the entire arm. When sitting quietly this tremor did not affect the leg, but the leg became somewhat affected during walking. Putting her hand on a flat surface, as on the table, the tremor ceased temporarily. The patient said also that the hand did not shake when she was lying in bed, awake or asleep. The movement was increased by a volitional effort to hold up

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*Read before the College of Physicians of Philadelphia, May 4, 1910.

†The symptoms here described are a summary of the results obtained on several examinations made during the first week or ten days after she first came under observation.

the arm away from the bed. Studying the movement more closely it was seen to be slightly jerky, with a partial extending and flexing of the hand at the wrist. The head and face were not affected by the movement, but she had what she described as a sense of "drawing" in the right side of the face.

Some loss of power was present in the right upper extremity, and to a less degree in the lower extremity of the same side, as indicated by her ability to perform active movements and to resist passive movements. She had much difficulty in using the hand and fingers in performing finer movements, such as buttoning and unbuttoning her clothing. She showed weakness and awkwardness in the right arm in attempting the finger to nose test.

She was tested in various ways for powers of orientation and muscular sense. In having her blindfolded and attempting to move each arm through the same space, she did this awkwardly with the right arm and hand, although the space covered did not differ much on the two sides. Testing her by holding the fingers laterally and moving the parts on their joints, she was unable to repeat these movements or to reproduce the positions properly with the unaffected hand. Besides testing with finger movements, sense of position was also studied by movements of the larger joints, as the wrist and elbow, with the same result, that is, the examination indicated the loss of the sense of position and passive movement

Efforts were made to have her mark out on a ruler distances like an inch, or several inches, or parts of an inch, with the separated finger and thumb of each hand. She did this with fair precision with the unaffected hand, but in attempting to carry out the test with the right finger and thumb she exhibited much awkwardness. She marked the distance on the ruler nearly correctly, but her finger hovered and shook in the attempt. She had well marked astereognosis in the right hand, not being able to recognize various objects with the fingers and hand of this side, these objects being promptly recognized by the left hand.

Several examinations were made to test her various forms of sensibility. The senses of pain and touch were not impaired. Spot localization was preserved. She did not always touch with precision the spot touched by the investigator. This was apparently due to uncertainty in the use of the unaffected hand rather than to real impairment of the sense of location. The sense of pressure was preserved.

One of the most interesting results obtained in this case was with regard to tactile discrimination. Testing with the compass points the patient could not recognize them at twice the distance on the right hand, back and front, that she could on the left hand,—indeed she could scarcely recognize them as distinct points at any separation.

These tests were repeated with the same result at different examinations. The conditions as to impairment of power, sense of position and sensation were the same in the lower as in the upper extremity, but were not so marked.

Ptosis was not present, and the ocular movements were not impaired. The right pupil, however, was somewhat larger than the left.

The following report by Dr. S. D. Risley, to whom the case was referred for ophthalmic examination, is of interest:

"A careful study of Mrs. C.'s ocular condition shows normal sharpness of central vision through correcting glasses. The fields of vision are also normal and the ophthalmoscope reveals only too full retinal veins, suggesting a possible increased blood pressure, but probably not too high for her age. The only thing I can discover about the eyes which may throw any light upon her intracranial disease is the fact that while both pupils react promptly, the right is larger than the left, the relative difference in size being greater in the diffused light of the consulting room than when facing a strong light with both eyes. This suggests an impairment of the light sense in the right eye, probably due to some disturbance, a stimulus possibly within the reflex arc or impaired perception at the oculo-motor nucleus or higher up."

The urine analysis showed an acid reaction, specific gravity at 15° C., 1023. A trace of albumen was present, but sugar was not found. The microscopic examination of the urine showed a few uric acid crystals and a few oxylate crystals; leucocytes present; squamous epithelial and numerous deep tissue cells; a few hyaline casts and various cylindroids.

This case is of much interest, as the representative of a comparatively rare symptom complex. In the main it is that which is sometimes spoken of as the Benedikt syndrome. The lesion in this case was probably one involving the peduncle near the nucleus ruber. In lesions of the peduncle some form of oculo-motor paralysis is present on the side of the lesion, with hemiplegia or hemiparesis on the opposite side. In connection with this, in the so-called Benedikt syndrome a tremor which has sometimes been spoken of as like that of paralysis agitans, may occur on the paretic or paralyzed side. The oculo-motor trouble may be partial or total, or may even involve both sides, according to the extent of the lesion. In this case, if the dilated pupil is to be regarded as a form of oculo-motor paresis, this involvement was very partial. According to some, the tremor is rather of the intention type than of the type of paralysis agitans. If the lesion involves more of the tegmental region, hemiataxia may occur with, as in our case, loss of the sense of position. Leube[1] cites a case of hemiataxia, the oculo-motor involvement consisting only of a constant ptosis and dilatation, the dilatation occurring later, but no other involvement of ocular muscles. Slight athetosis was present in both feet, but no distinct tremor or ataxia. Some sensory changes were also present on the paralyzed side in this case. Necropsy showed numerous small hemorrhagic areas in the peduncle and tegmentum.

Southard, in Vol. VII of Osler's "*Modern Medicine*" (Chapter XV, on Encephalitis and Brain Abscess), cites a case of Combe's illustrating a peculiar combination of symptoms in encephalitis with multiple foci. "The form of alternate paralysis known as Weber's syndrome," says Southard, "viz., right hemiparesis and left ophthalmoplegia, appeared in a boy aged two years. Weir-Mitchell's[2] post-hemiplegic choreiform movements followed on the right side, but associated with spasmodic movements in the field of the left facial and abducens nerves, amounting to an alternating hemichorea. Later there was weakness of the right oculo-motor nerve. Such hemiparesis with crossed paralysis of the oculo-motor nerve with tremors of the paralyzed parts corresponds with Benedikt's syndrome (due to a lesion of the cerebral peduncle), but the involvement of the left facial and abducens nerves together with the right-sided hemiparesis amounts to the Millard-Gubler syndrome. The patient, therefore, suffered from a combination of Benedikt's syndrome and the Millard-Gubler syndrome, due to a lesion of the pons near the left pyramidal tract (this new syndrome Combe proposes to call the inferior Benedikt syndrome), but in addition showed a complication by incomplete ophthalmoplegia, due to a separate lesion situated in the oculo-motor nuclei."

This case was unlike the one here presented in that it showed no sensory involvement, and was located too far spinalwards. It is, however, in some respects similar, as in the presence of the tremor on the hemiparetic side.

Bonhoeffer,[3] after referring to some cases of others, and to two cases of his own, one with necropsy, speaks of the theories which have been advanced in the explanation of the hemiplegic or post-hemiplegic disorders of movement.

Kahler and Pick believe that this movement was due to irritation of the pyramidal tracts.

Anton, cited by Bonhoeffer, published a case of bilateral choreoid movements, in which the necropsy revealed a bilateral lesion situated in the putamen of the lenticula. The same author, Anton, mentioned another case in which the lesion was in the thalamus.

Meynert and Nothnagel made similar observations earlier.

Anton believes in the existence of an antagonism between the lenticula and the thalamus. The lenticula, or certain parts of it, exercises an inhibitory influence over automatic impulses. Therefore, a destructive lesion of the lenticula interfering with the inhibitory influence would permit movements which would otherwise be controlled. The thalamus, on the other hand, exerts an accelerating influence over automatic impulses. The result, naturally, according as the lesion was irritative or destructive, would be the production or the suppression of the movement. According to this theory an equilibrium is established as regards coördinate movements between the lenticula and the thalamus. Anton calls attention to the observations of Freud, that the movements of infants and youthful children are of a choreoid nature, and also to the fact that in the diplegias occurring in childhood, such athetoid movements are of frequent occurrence.

Bonhoeffer calls attention to the well known facts that in the early stage of hemiplegia, choreoid movements are absent, and first present themselves with the return of some voluntary power, these increasing in proportion to the return of this power and the efforts at voluntary movement.

Bonhoeffer refers to an apoplectic case, in which choreiform movements were present, with marked hypotonia. This hypotonia was almost to the extent of a complete flaccidity. In this case, as in others, while impairment of power was present, it was not of the character which is seen in lesions of the pyramidal tracts.

Pineles, von Monakow and Bernard Sachs also call attention to hypotonic flaccidity in cases of hemiplegic and post-hemiplegic chorea, so-called. In ten out of eighteen of Freud's cases with choreiform movements, contractures were absent. These facts, according to Bonhoeffer, contradict the theory that such movements are due to irritation of the pyramidal tracts. They are rather, according to him, due to interference with centripetal pathways. According to Bonhoeffer we have three positive reasons for the theory that choreoid-athetoid movements are due to lesions of the tract passing centripetally from the cerebellum to the motor cortex: (1) The constant occurrence in cases with these movements of a lesion of the superior cerebellar peduncle or its continuation into the subcortical ganglia. (2) The hypotonia of the musculature in such cases. (3) The disturbance of the voluntary movement occurring in chorea in addition to the involuntary movements present.

Bonhoeffer refers to the fact that Gowers had spoken of the occurrence of the athetoid movements in cases of cerebellar lesion. Von Monakow believed that impulses from the subcortical lesion passed to the motor cortex and there acted upon the pyramidal system in such a way as to cause the irregular (choreoid-athetoid) movements. Bonhoeffer agrees with von Monakow insofar that he holds that these choreiform movements are caused by interfering with the tracts which go from the tegmentum cortexward, and, under normal conditions, serve to steady movements controlled by the pyramidal system.

He believes, however, that while some tracts go from the tegmentum to the cortex, others pass into the subcortical ganglia (nucleus ruber and thalamus), and, according as one or the other of these tracts is interfered with, will be the effect. If the cortical tract is cut off the impulses will go by a short cut through the nucleus ruber, and in this way the incoördinate movements may be brought about; there is a flow of automatic movements in the ganglia, and according to the extent of the lesion will be the effect in motor symptoms.

He states that he had the opportunity of observing a case with accumulating symptoms and also impairment of power and movement gradually growing, in which, in the necropsy, he discovered a lesion about the size of a cherry at the decussation of the two superior cerebellar peduncles. Reasoning from this case, and other data, he concludes that tracts pass from the cerebellum to the red nucleus, and other tracts from the cerebellum to the thalamus and to the lenticula, and that a lesion of any of these tracts might give rise to disorders of movement of a choreoid or athetoid character. It follows, therefore, that a lesion in the superior cerebellar peduncle, if situated at a certain part, would give rise to such manifestations. Bonhoeffer cites cases of Newton and Sander in support of his decision. In the former the lesions were in the neighborhood of the nucleus ruber, and in the latter in the region of the corpus dentatum in the cerebellum.

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REPORT OF TWO CASES OF CHRONIC CYANOSIS WITH POLYCYTHEMIA, INCLUDING OPHTHALMOSCOPIC EXAMINATION.*

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AND

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The comparative infrequency of reports of cases of chronic cyanosis with polycythemia, accompanied by a detailed description of the fundus, has led the authors to report a case that has been under observation for the past three years, together with a second case that has been under observation only during the past two weeks. The first case occurred in the service of Dr. George Dock, in the medical clinic of the University of Michigan, and was reported by Dr. Smithies in a paper entitled "The Clinical Aspect of Tumors of the Mediastina,"† and we are indebted to this report for notes on Case I, with the exception of those on the eyes, which were made in the ophthalmologic clinic. Case II presents itself in the ophthalmologic clinic for relief of intense frontal and occipital headaches, accompanied by difficulty in use of eyes.

CASE I.—This case presents the clinical picture of chronic cyanosis, with variable polycythemia; splenic enlargement; attacks of asthmatic dyspnea; albuminuria; involvement of the mediastinal tissues, as shown by symptomatic, physical, and radiographic examination.

Patient, male, aged forty-three, American laborer. Entered the Medical Clinic in January, 1907. He complained of difficulty in breathing, palpitation, frontal and occipital headaches, chronic cyanosis, dropsy, and general weakness.

Family History.—Negative.

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*Read before the American Ophthalmological Society, Washington, D. C., May 4, 1910.

†Jour. Amer. Med. Assoc., September 12, 1908.

Personal History.—Up to the age of thirty the patient had enjoyed good health. At this time he began to have asthmatic attacks, coming on at irregular intervals, usually at night. The patient's habits were good, and there was no history of specific disease. About six years before entering the hospital he had what he termed a severe attack of "asthma," which lasted for a few moments, during which he became unconscious. About four years ago he noticed blueness of the face, hands, and feet, with variable swelling. He took medicine at this time and believed that the blueness had about disappeared. It did not again become marked until September, 1906. At this time the blueness increased, becoming especially marked when he worked or when he was excited, while palpitation with dyspnea became a prominent symptom. He began also to suffer from severe frontal headaches and dizziness, and his eyes became prominent.

Examination.—This revealed a man of medium build, with no pronounced evidences of emaciation. Over the face and neck, particularly the nose, chin, lips and ears, there existed a startling degree of cyanosis. The hands and feet were moderately blue, particularly when the patient stood or allowed his arms to hang down. The cyanosis was less marked when he was in the recumbent position. Exercise and psychic disturbances deepened the color perceptibly. The palate and tongue were deep purple. The eyes were prominent, especially the right eye, which protruded 6 mm. further forward than the left. The conjunctivae were suffused—the right more than the left. The pupils were of moderate size, an anterior synechia in the left eye making comparison difficult. Over the trunk the skin had a bluish cast. The respiration became rapidly accelerated on even slight exertion. The heartbeat was faintly visible on the fifth interspace, well inside the nipple. Its rate was not increased. The lungs showed signs of emphysema.

Auscultation of the Heart.—All sounds were heard with difficulty. The first sound at the apex was heard best two finger-breadths inside the midclavicular line, in the sixth intercostal space. The sounds over the base were best heard in the fourth left space and beneath the adjacent sternum. The first sound at the apex was soft and somewhat impure; the pulmonic second sound was moderately accentuated.

The radial pulse was slow, of moderate size, and fuller on the left than on the right. There was moderate sclerosis of the radials. The blood-pressure varied with the side tested. On the left the pressure was—systolic, 156 mm. Hg.; and the diastolic, 109 mm. On the right, the systolic pressure 146, the diastolic 98, with the Erlanger apparatus 12 cm. cuff.

The liver was felt with difficulty at the end of inspiration. The spleen was not palpable in whatever position the patient lay. (Later the spleen became enlarged.)

Blood Examination.—At time of entry the red-cell count was 6,540,000. The hemoglobin was 100 per cent. plus. The white cells were about 6500. The blood was very deep red, flowed slowly, and was extremely viscous. It was spread on a slide with great difficulty. There was nothing peculiar about the shape or the size of the red cells. The differential white count was as follows: Small lymphocytes, 14.8 per cent; large lymphocytes, 3.8 per cent; polynuclears, 67.6 per cent; eosinophile polynuclears, 3.8 per cent; mast-cells, 1.6 per cent; and degenerates, 8.4 per cent. Recently an estimation of the specific gravity of the blood by Hammerschlag's method was 1062, when the red-cell count was 7,400,000. The coagulation time was difficult to estimate with the pipet method, because of the extreme viscosity of the blood. By the slide method coagulation was frequently complete at the end of a minute in an ordinarily warm room. It was often less than this. Unfortunately, no estimation of relations between corpuscles and plasma was made.

Urine.—This contained a moderate amount of albumin, with many small, finely and coarsely granular casts and numerous cylindroids.

Fluoroscopic examination and radiogram revealed a non-pulsating shadow, evidently filling the mediastinum, that was thought might be a tumor.

In the summary of his report Dr. Smithies states: "It is not quite determined that the two conditions (referring to mediastinal growth and chronic cyanosis with polycythemia) do not exist, but in view of the rather marked variations in the cyanosis and the red-cell count, it is probable that much of the polycythemia is due to extensive pressure in the thorax on the great vessels." The subsequent history, however, has made this less probable than at first appeared to be the case.

Subsequent History.—Under rest and treatment he improved and was soon up and about. Part of the time the cyanosis diminished, when the patient would be fairly comfortable and able to do light work. If he worked hard or became excited, the cyanosis became more pronounced, and he complained of feelings of fullness in the chest, with difficult breathing. Occasionally the cyanosis became extreme and was associated with unconsciousness, stupor, or apathy; disturbances in vision; paroxysmal headaches; albuminuria, and gastro-intestinal symptoms. In all, 17 such attacks were noted. At times the color of the face and extremities was a dusky, slaty purple, while over the trunk the skin had a bluish cast. With the occurrence of the cyanosis the patient suffered extreme dyspnea, which sometimes lasted for but a few minutes, then again persisted for half an hour or longer. During the attacks the heart rate was accelerated, going as high as 130. The peripheral vessels were greatly injected.

Disturbances in Vision.—At times there were merely spots before the eyes, with blurring of vision. On one occasion there was diplopia.

Eye Examination.—Vision, O. D., 20/100; O. S., 20/50. Both eyes prominent and injected, more marked in right. Pupil O. D. moderately dilated and active. Scar at inner limbus, O. S., to which iris was attached.

Description of Fundus.—Ophthalmoscopic examination erect image. Media clear; connective-tissue ring present, broadest on temporal side; all somewhat blurred. The general color of the disk is a shining, yellowish red. Deep, cone-shaped physiologic cup. The nasal half of the disk is veiled and edematous, over which numerous minute vessels trace. The ascending artery to nasal retina divides at the disk margin into two branches, the upper being slightly tortuous. Where this branch crosses the ascending nasal vein it is slightly blurred, and the vein beneath appears blurred in the edematous retina. The ascending temporal artery has three or four fusiform dilatations between the disk margin and the first branch. It is not tortuous in its outer portion. The inferior temporal artery at its origin passes well above its corresponding vein, and pursues a slightly tortuous course outward and a little downward.

All the veins are markedly tortuous and dilated. The descending nasal is nearly hidden at its origin in the swollen disk margin. The inferior temporal vein is similarly blurred, both on the disk and at a bend nearly a papilla's breadth below, where it dips down into the retina. On a branch of the superior temporal vein, well without the macula, is a small aneurysm of globular form and pedunculated. Many of the smaller veins are exceedingly tortuous, and many are unusually abrupt as they come into view. The arteries pulsate distinctly. Venous pulsation is absent.

The general color of the retina is of a deeper red than is usual in a blonde, and the usual details are absent, owing to the edematous condition present.

The macular region is edematous and slightly deeper in color than the surrounding retina. The foveal reflex is present (*Vide Plate Frontispiece.*)

One of us (Dr. Slocum), when examining the fundus one week after noting the presence of the small aneurysm, observed that it had ruptured, and in its place was seen a small, rounded hemorrhage, having about four times the area of the aneurysm. This absorbed in a few days, leaving no trace behind. A second small venous hemorrhage was noted, three disks in diameter, up and out, on a small branch of the superior temporal, which enters from above.

Since leaving the hospital in January, 1908, the patient has been more comfortable than for two years previously to that time. He has had no periods of unconsciousness. While subject to attacks of increased cyanosis with dyspnea and general weakness, he has been able to run a peanut wagon about half the time. The fundus of the eye has all the characteristics seen in the drawing, but not to so great a degree. April 26, 1910, the vision in each eye was 6/9 pt. The fusiform dilatations on the arteries had nearly disappeared. Exophthalmos: O. D., 21 mm.; O. S., 19 mm. Tension. O. D., 25 mm. Hg; O. S., 17 mm. Hg.

We are indebted to Professor Hewlett for the following report (April 28, 1910): "Heart is enormously dilated. Lower portion of the chest is retracted and immobile. The abdomen is prominent, but there is no ascites. The spleen is just palpable. The lungs show signs of emphysema, with very little bronchitis at the present time. There is moderate edema of the legs. *Blood*: Red blood-corpuscles, 7,200,000; white blood-cells, 10,320; hemoglobin, 120 per cent. Dare; blood-pressure, 136."

CASE II.—This case presents the clinical picture of chronic cyanosis with polycythemia, enlargement of the spleen, severe headaches, marked dyspnea, and general weakness.

Patient, male, aged thirty-one, American farmer. Entered the ophthalmologic clinic of the University Hospital April 24, 1910. He complained of severe frontal headache, blurring of vision, and diplopia, associated with extreme general weakness.

Family History.—Father deaf and subject to attacks of vertigo. Otherwise negative.

Personal History.—Always well until one year ago, when he suffered from severe frontal headaches, numbness in the fingers, tinnitus aurium both ears, and great general weakness. Has dyspnea most of the time, and an occasional attack of diplopia and blurred vision, accompanied by vertigo. One year ago first noticed blueness of skin, most marked on ears, nose, lips, and finger-tips.

We are indebted to Professor Hewlett for the following report:

Patient shows ordinary distribution of a general cyanosis. Lungs negative. Heart moderately enlarged, but no signs of valvular disease. Blood-pressure, 165. The spleen is easily felt one inch below costal margin on deep inspiration. Liver not enlarged. There is a slight general glandular enlargement. Red blood-corpuscles, 8,000,000 to 9,000,000; white blood-corpuscles, 14,000; hemoglobin, 110 per cent.

Differential blood count: Small lymphocytes, 2.2 per cent.; large lymphocytes, 3.2 per cent.; transitional and polynuclear, 87 per cent.; eosinophile-polynuclear and mononuclear, 1.6 per cent.; myelocytes, 1.4 per cent.; mast-cells, 0.8 per cent.; degenerates, 3.8 per cent. One normoblast and one megaloblast seen. Some irregularity in reds, but not marked.

Eye Examination.—Vision, O. D., 6/7.5; O. S., 6/9. Pupils equal and active. Reflexes normal. Muscle excursion normal. Esophoria for distance 6°, orthophoria for near.

Ophthalmoscopic examination: O. D., media clear; margin of disk blurred. Hyperemia of retina, and edema around disk. Veins much engorged, tortuous and dark in color. Slight arteriovenous compression. O. S., media clear. Margin of disk more blurred, but retina not so hyperemic as in O. D. Veins much engorged, tortuous, and dark in color. Arteries not increased in size, but slightly tortuous.

The history of these two cases is quite similar to those heretofore reported. In the year 1892 Vaquez[1] reported a typical case, but without an ophthalmoscopic examination. Osler[2], in 1903, reported four cases, and added five cases from the literature. He emphasizes the statement of Soundby and Russell, to the effect that in this group of cases we have "a definite clinical entity, and one which is new to medical science."

The condition is sometimes spoken of as the Osler-Vaquez disease.

Three years ago Jackson[3] presented before this society the report of a case with the ophthalmoscopic appearance. He also reviewed the findings in all the published cases in which an ophthalmoscopic examination had been made.

According to Glaesner[4], the three symptoms that go to make up the symptom-complex of chronic cyanosis with polycythemia are cyanosis, polycythemia, and enlarged spleen. The cyanosis is the symptom that attracts most attention. It is most marked about the face and hands, although the whole body may be of a bluish cast. The color of the lips and tongue is well described by Jackson, who compared it to that of a ripe Concord grape. All observers have noted not only the dark color, but the thick and sticky character of the blood. The reds are greatly increased in number; the maximum blood-count is reported by Cabot[5]—12,000,000 per c.mm. The percentage of hemoglobin in the majority of cases varies from 120 to 165, although in Koster's[6] case it showed 240%.

The enlargement of the spleen is present, as a rule, but may be wanting.

In all cases where the fundus findings are reported the change appears to be limited to the engorgement of the veins, with its consequent edema of the retina, with occasional hemorrhages.

Uthoff, who reported a case before the Heidelberg Congress in 1906, emphasized the importance of an ophthalmic examination in every case, believing that this disease in its milder forms is much more common than is generally supposed.

The pathology is still obscure.

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SOME UNUSUAL OPHTHALMIC CASES.

READING WITH THE LINES PLACED VERTICALLY; PAPILLOMA OF THE CORNEAL LIMBUS; PAPILLOMA OF THE LACRIMAL CARUNCLE AND CONJUNCTIVA; SARCOMA OF THE CHORIOID WITH MARKED ORBITAL CELLULITIS; METASTATIC PANOPHTHALMITIS FROM A PELVIC ABSCESS.

C. A. Veasey, A. M., M. D.,

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The following cases are of sufficiently infrequent occurrence to merit their isolated report:

I.—READING WITH THE LINES PLACED VERTICALLY.

J. L. H., a country school teacher, aged thirty-eight years, was referred to me, in November, 1906, for an examination of his eyes. He was wearing glasses prescribed at a dispensary, and with these his vision in each eye was 6/45. He had been wearing glasses since fourteen years of age. Marked horizontal nystagmus and dizziness had been present ever since he could remember. There was a divergent strabismus of 20°, the left being the fixing eye. The iris was deficient in pigment, though not so marked as in an albino.

The most peculiar condition of the patient's eyes, however, was that he could only read with the lines of print placed in a vertical position. Moreover, the beginning of the line had to be placed downward, the end upward. With the line reversed he was so confused that he could read but slowly, but with the position to which he had accustomed himself he could read quite rapidly. With print placed in the usual horizontal position he could scarcely make out anything.

The patient was refracted under a cycloplegic and was given the following correction:

O. D. + S. 1.25 D. with + C. 4.00 D, ax. 90°
O. S. + S. 1.25 D. with + C. 4.00 D, ax. 90°

and with this obtained a vision of 6/30 in each eye. After using this correction for a time the patient could read very slowly with the print placed approximately in the horizontal position (the right end about 15° above horizontal), but he could always read with a fair degree of rapidity with the lines placed vertically and so continued in the manner to which he was accustomed.

Dimmer[1] reported a similar case in *Graefe's Archives* in 1907, observed in a nine-year-old boy. There was marked nystagmus, the time of onset being indefinite, but it had been growing somewhat better. In school it had been noticed that in reading wall tablets he invariably inclined his head toward his right shoulder and in near reading held his book so that the lines were at right angles to the line of vision, the head being straight. The nystagmus was horizontal and quite marked. The fundi were normal and vision was .2 in O. D. and .3 in O. S. No abnormality was apparent in writing.

Dimmer's explanation of the phenomenon was that in all cases of nystagmus there must be for a time apparent movement of the object observed. If this continues until the child begins to read, it is apparent that reading will be easier if the line be held vertical to the basal line of the eyes, because when so held only movement of the letters occurs, and the apparent image of one letter does not run into the image of the next succeeding letter. If the line be held in the horizontal position the images of the individual letters become at once confused. Dimmer reproduced the condition experimentally with a camera, obtaining a negative which showed that the letters could be easily recognized when the line was held vertically and the camera given a horizontal movement during the exposure. A negative obtained, however, when the line was placed horizontally and the camera moved horizontally during exposure, showed great confusion from overlapping of the letters.

II.—PAPILLOMA OF THE CORNEAL LIMBUS.

M. B., aged fifty-nine years, presented herself at my clinic at the Methodist Episcopal Hospital, Philadelphia, May 19, 1907, because of extensive sub-conjunctival hemorrhages in the left eye which had been present two days. The patient had a severe bronchitis and the hemorrhages occurred after a paroxysm of severe coughing. Examination of the urine was negative and the patient was in good physical condition excepting the bronchial affection referred to.

In the conjunctiva of the right eye there was a pinkish growth about 1 cm. long and 1½ cm. broad, attached by one margin to the corneo-scleral junction, but otherwise directly mobile. This was situated directly below the cornea over and above the insertion of the inferior rectus muscle. According to the patient it had been observed first, five years before, and had increased in size very slowly. Vision with glasses was normal and there were no ophthalmoscopic changes. The patient was a mulatto.

The growth was excised under cocaine anesthesia and the area of attachment to the corneo-scleral margin thoroughly curetted and cauterized.

Microscopical examination showed the tumor to be a papilloma.

III.—PAPILLOMA OF THE LACRIMAL CARUNCLE AND CONJUNCTIVA. CHRONIC RETRO-BULBAR NEURITIS.

R. W. S., a bachelor aged thirty-seven years, first came under observation because of a chronic retrobulbar neuritis due to the excessive use of tobacco and alcohol. He presented typical central scotomas for colors and his vision was reduced to 3/45 in each eye without glasses and 5/30 in each eye with glasses, his refraction being a myopia of 3.00 D. Tobacco and alcohol were discontinued and with the employment of the iodides and strychnia, vision, both distant and near, was restored to normal.

At the inner angle of the right eye there was a small flattened growth which had been observed first twelve years before. It had increased in size very gradually and at times became more or less inflamed, at such times being larger than when no inflammation was present. At the time of examination it was about 7 mm. long and 4 mm. broad in its thickest portion, attached by a very narrow base extending its full length and apparently having its origin in the lacrimal caruncle. A portion of the growth about the size of a small green pea extended constantly between the eyelids directly in front of the caruncle, preventing their complete closure. No history of injury could be obtained nor was there any family history of tumors of any kind.

The growth was excised under cocaine anesthesia and was a papilloma.

All tumors of the lacrimal caruncle are of exceedingly rare occurrence. It has been the writer's good fortune to observe several. In 1897 he reported a case of primary sarcoma,[2] in 1902 a case of adenoma,[3] and in 1905 a case of papilloma,[4] all having their origin in the caruncle. In addition he had the opportunity of studying a case of carcinoma primary in the caruncle which was removed by Dr. Geo. E. de Schweinitz at the Jefferson Medical College Hospital many years ago and afterwards reported by him before the American Ophthalmological Society.[5]

IV.—SARCOMA OF THE CHORIOID WITH MARKED ORBITAL CELLULITIS.

C. J., a male, aged about thirty years, came to the office for treatment September 27, 1909. According to his statement he first observed that his vision in the left eye began to fail about nine months before, but he was positive that he could distinguish the difference between light and darkness until a few days prior to coming to us. At that time the eye became intensely painful and the orbital tissues and lids commenced to swell. At the time of examination there was great pain, marked orbital cellulitis was present, the eyelids being so swollen it was with much difficulty they could be separated sufficiently to permit an examination of the cornea, and the eyeball was almost fixed, possessing only very slight lateral movement. The pupil was dilated and immobile and through it could be seen a whitish area situated some distance posterior to the plane of the iris. It was practically impossible to test the tension because of the severe cellulitis. No family history of tumors could be elicited and the patient otherwise appeared to be in good health.

The eye was enucleated by one of my colleagues, Dr. Wilson Johnston. Some adhesions were found in the posterior part of the orbit, but the wound healed without trouble and the cellulitis at once subsided.

Upon opening the eyeball, after hardening, it was found to contain a large lobulated dark growth occupying the greater part of the posterior half of the globe and extending forward on one side to the ciliary body. The retina was detached, lying *en masse,* around which the tumor grew, the lens being dislocated backward lying in the mass. There was no perforation of the globe at any part and no external indication of the condition found within. Whether the severe cellulitis which was present and which brought the patient for treatment was caused by the intraocular growth or was merely a coincidence is not known, but it subsided immediately after the enucleation, which, of course, could have been due either to the removal of the cause or to good drainage.

V.—METASTATIC PANOPHTHALMITIS FROM A PELVIC ABSCESS.

Mrs. S—, a married woman, aged about thirty-two years, with healthy children, was referred to me March 28, 1909, because of a profuse purulent discharge from the left eye which had been present for several weeks and which the attending physician had been unable to check.

Six weeks before there had been a pelvic abscess, with severe illness, which evacuated itself through the vagina. There were reasons to believe that gonorrhea preceded the formation of the abscess, but no microscopic examination of the discharge had been made.

One week after the abscess began to discharge through the vagina, and while the patient was convalescing, she became suddenly blind in the left eye. Excessive pain and edema of the orbital tissues and lids immediately followed. No ophthalmic surgeon was available and nothing excepting cold compresses and cleansing lotions was employed. A few days later marked purulent discharge was observed to come from between the lids, and with its appearance the pain ceased and the edema subsided. Treatment of this discharge with lotions and silver preparations failing to control it, and the patient being somewhat improved in health, she was referred to me.

Examination of the palpebral and ocular conjunctiva showed it to be slightly congested, but the discharge was not coming from this source. Further examination revealed a small opening into the eyeball situated in the sclera about 1 cm. to the temporal side of the corneo-scleral junction through which a probe could be passed and from which the discharge was observed to emanate. The eyeball was soft and slightly shrunken, though not so much as might be supposed. Through the pupil a whitish exudate could be seen and the anterior chamber was very shallow but otherwise normal in appearance.

Immediate enucleation was performed and the patient made an uneventful recovery and is now in good health. It is to be regretted that means were not at hand for making an examination of the discharge from the eyeball; and the specimen which was sent to a laboratory for microscopical study was unfortunately lost.

Traders Bank Building.

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REPORT OF A CASE OF LEUKOSARCOMA OF THE IRIS SUCCESSFULLY REMOVED BY IRIDECTOMY AND USEFUL VISION RETAINED.*

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(PATHOLOGIC FINDINGS BY HAROLD G. GOLDBERG, M. D.)

That sarcoma of the uveal tract is seldom observed as a primary disease of the iris, and still more rarely of the colorless variety, is my excuse for reporting this interesting case. In reviewing the very complete "Statistical Study of Primary Sarcoma of the Iris" in the Annals of Ophthalmology, vol. vi, No. iv, October, 1897, by Dr. Clarence A. Veasey, I find that this case, which I herewith report, is unique as occurring in a female at the age when sarcoma of the iris is most rarely found, and the variety of the growth is of the mixed-celled class, which is also of the most unusual type.

Annie G., aged twenty-seven years, born in Ireland, waitress by occupation, came under observation in October, 1906, when twenty-four years of age, with the following history: Had never known what it was to be able to see as clearly as her relatives and friends, and vision of right eye never as good as that of the left. Always had more or less headache, which she now attributes to her eyes. Says she has always been known as the weak or delicate one of eight children, being very thin and also pale of complexion. When six years of age, without any known reason, all her hair fell out and she was bald and compelled to wear a cap for about one year, when the hair gradually grew and has been full and strong ever since; in fact, she has more hair than she requires. Family physician at that time said that the falling of the hair was due to "weak nerves." No other member of the family was similarly afflicted. In fact, the members of her family are all of robust health. Her hair at present is dark brown in color and most abundant. Patient had the ordinary diseases of childhood, measles, whooping cough, and chickenpox. Never had scarlatina or diphtheria. Vaccination took normally. Menstruation commenced at thirteen and one-half years, regular and normal.

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*Read before the American Ophthalmological Society, Washington, D. C., May 3, 1910.

October, 1906, condition of eyes as follows. Right eye noticeably divergent; pupil 4 mm. in diameter and round. Iris blue in color, and reacts promptly to light, convergence, and accommodation. Left eye, the fixing eye. Iris also blue in color, and reacts normally. Pupil same as its fellow. R. E. V = 6/30; L. E. V = 4/12½. Ophthalmoscopic examination: R. E., media clear, disk vertically oval, axis 105°. No gross fundus changes. Refraction; mixed astigmatism. L. E., media clear, disk oval, axis 45°. Retinoscope reveals slight conicity of cornea. Refraction equals plus cylinder. Glasses ordered: R. E., — 2.50 sph. ⌢ + 4.50 cyl. axis 105°; V = 4/25; L. E., + 1.50 cyl. axis 35°; V = 4/7½.

Patient returned three years later, namely, October, 1909, stating that the headaches of which she complained at her former visits had ceased since wearing the glasses, and that she returned at this time on account of a white spot in the lower outer quadrant of the left iris, which had first been noticed by her friends during the previous February. This white spot had gradually reached its present size from a small beginning, about the size of a common pin-head. Its present size is about 3 × 4 mm., and is shown in accompanying colored sketch. It is more of a whitish-yellow cast, and at its summit has a pinkish color and some few vessels, as seen with magnifying glass. The growth does not extend to the ciliary border of the iris. No history of any pain, soreness, or redness in or about the eye since this condition was first noticed. Vision with correcting glasses has remained unchanged. No fundus changes noted through a dilated pupil.

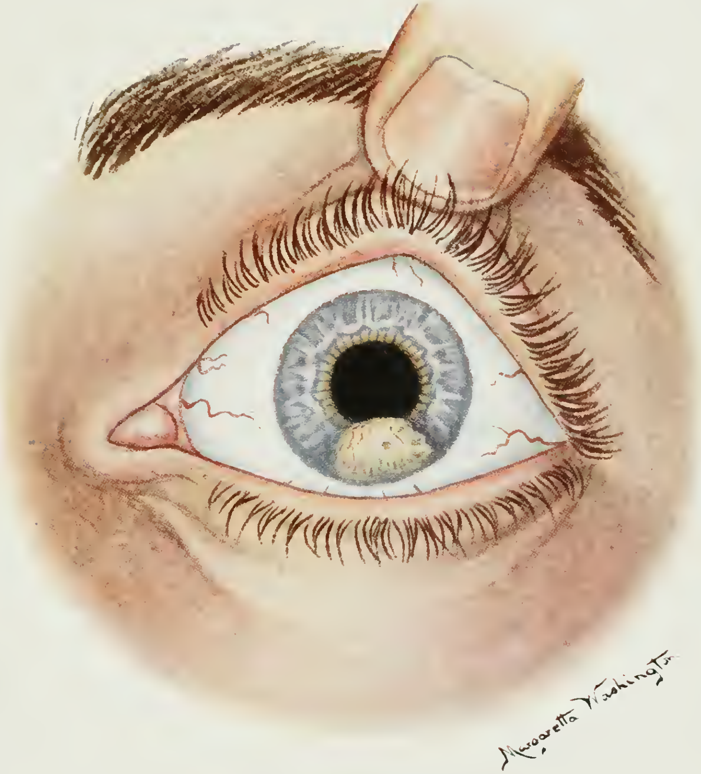
Diagnosis, leukosarcoma, for the following reasons: (*a*) Patient, a female—sarcoma of the iris occurs in females in 70% of the cases. (*b*) Lower outer quadrant of the iris the most common seat of the growth. (*c*) No history of injury and no history or evidence of syphilis or tuberculosis.

(*d*) Growth did not resemble gumma, tubercle, or melanoma.

Taking advantage of the kind offer of Dr. de Schweinitz to see this patient at his clinic, I was pleased to have this most probable diagnosis confirmed.

In the consideration of treatment it was deemed advisable to remove the growth by iridectomy as promptly as possible. Patient was admitted to the Polyclinic Hospital the following day, October 20, 1909. Blood count normal; urine negative; lungs, heart, and liver normal. On October 21st ether was administered, and I removed the growth in situ, together with surrounding healthy iris tissue. First making a large corneal section with a broad Graefe cataract knife in the lower outer quadrant of the cornea, the iris and growth were permitted to prolapse from the corneal wound. With iris forceps the iris was drawn out at the temporal side of the growth and incised; then the iris was gradually torn from its root downward to the nasal side of the corneal wound and excised. There was no unusual amount of hemorrhage. However, the conic corneal condition previously mentioned became a factor as soon as the corneal wound was made, as the cone immediately collapsed and for a few seconds obstructed the view. The corneal wound healed promptly and without any bad symptoms. Subsequent refraction: L. E., — 1.00 sph. ⊃ + 3.00 cyl. axis 30°. V = 4/6. The specimen was placed in a 5% formalin solution, and given to Dr. Harold G. Goldberg, who prepared the section and reported as follows:

The main body of the growth is made up of small round sarcoma cells with a few spindle-cells, these possibly the result of sectioning. The stroma has been entirely replaced, and the retinal pigment is somewhat proliferated. There is almost complete atrophy of the muscle; only traces of the transverse fibers can be seen. The retinal surface is the most vascular, and here typical blood-spaces are found, some containing polynuclear leukocytes, and some few with a modified endothelial lining. These last, however, are not perfect, but are made up of only one wall. On the anterior surface of the iris the growth is somewhat lobulated in appearance, and here the spindle-cells predominate. The lobules seem to extend through the limiting membrane to the surface in the form of plugs. These can best be observed in the longitudinal sec-



Leukosarcoma of the Iris

tions, and are undoubtedly growth extensions. There is a general proliferation of the endothelial elements throughout the entire mass.

April 30, 1901, the patient's eye is perfectly quiet and has good vision. The general health has never been better.

120 South 18th Street.

MARGINAL DEGENERATION OF THE CORNEA.*

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A difference of opinion still exists among clinicians as to whether the condition described by Schmidt-Rimpler under the term *chronic peripheral furrow keratitis*, and that described by Fuchs under the title of *marginal degeneration of the cornea*, are the same affection. The immediate peripheral relation of the groove to the arcus senilus and the absence of inflammatory symptoms in his cases, lead Fuchs to the belief that they are different conditions. Gilbert, who has studied three cases clinically, believes that the arcus or its remains can lie either centrally or peripherally to the groove. If the arcus is entirely absent he holds that it is not evidence against the degenerative character of the process, but that it indicates that the groove occupies the previous site of the arcus. He agrees with Seefelder that the disease in the great majority of the cases has its origin in a peculiar degeneration of the cornea which develops either from the arcus or from a similar concentrically placed opacity.

The disease process is very chronic with symptoms of mild irritation sometimes unilateral, sometimes bilateral. The groove is shallow, usually transparent and colorless, although it may show yellowish or grayish areas, the remains of an arcus senilus. It is sometimes followed by an ectasia of the thinned structure. Fuchs noted in some of his cases the presence of minute dots of hyalin degeneration at the margins of the furrow. According to Handmann, degenerative changes in the macular region are frequently present.

The most recent anatomical study of an eye presenting marginal degeneration of the cornea is that by Seefelder in the March number of the *Klinische Monatsbl. f. Augenheilkunde*. The clinical notes of this case showed that there had been a broad arcus with beginning furrow formation. The eye had been enucleated because of sympathetic ophthalmia. following cataract extraction. The points of interest in this case were that the changes represent an early stage, and that the conjunctiva covered the cornea almost to the entire width of the groove. He states that in all the cases which have been studied anatomically, the important changes have been a local degeneration of the corneal tissue, and an effort to compensate for the loss of corneal tissue by the formation of fibrillar tissue rich in nuclei and blood vessels. As this is only partially successful there results in the diseased area a thinning of the cornea which manifests itself clinically at first in the formation of a furrow. The complete degeneration of the substantia propria, together with Bowman's membrane, is preceded by a separation of their fibers and a splitting up of the lamella of the cornea into a loose fibrillary richly nucleated tissue. The ends of the fibers reaching to the margins of the affected area are club and wedge shaped, and are transparent. Fat globules are found in the corneal lamellæ in the vicinity of the furrow. A similar collection of fat globules within the corneal lamellae has been shown to be the cardinal symptom of arcus senilus, and as in nearly every case so far described there has been present an arcus, it leaves no doubt in this author's mind that the processes are very closely allied. The origin of the fat is in doubt. Fuss believes that it is a migratory product, whereas Seefelder believes that it is probably a local degenerative product. He is of the opinion that inflammation plays no immediate part in the production of marginal atrophy. He concludes that marginal atrophy is by far the most frequent cause of permanent thinning of the periphery of the cornea.

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Vandetti and Passera consider "*marginal thinning*" a more appropriate term than any which includes the word furrow, as in some cases no such lesion is present. But the reason for this is the stage of the disease in which the observation is made, as in a case of Seefelder, where a deep groove had been present and had disappeared at a later examination, the floor of the groove had the level of the surrounding cornea. Fleisher, who has seen several cases, calls attention to the deterioration of vision caused by irregular astigmatism, which probably indicates a beginning ectasia. In Knapp's case the condition had reached the stage of ectasia and was remarkable in being symmetrical, involving the periphery of the upper-inner quadrants.

My own case is that of a woman of forty-eight years, in good health, with florid complexion and no evidences of presenility, who came to Wills Hospital complaining of symptoms of conjunctival irritation. There is no history of previous inflammation of the eyes. In each eye there is a well marked groove encircling the margin of the cornea except for an arc of about 15 degrees down and in. It lies peripheral to the arcus, which is not uniformally dense, and is in places encroached upon by the furrow. At the upper limbus the conjunctiva is drawn over the margin of the cornea and is very slightly vascular. At several places along the margin a small point of conjunctiva is drawn over onto the cornea, and at other sites there are pin-point yellowish dots, probably small areas of hyalin degeneration. The surface of the furrow is everywhere reflecting, and there is no staining by fluorescine. There are no degenerative changes in the fundus. H.—5. D. The groove is not quite so pronounced in the left eye.

The case resembles very closely one of the original cases of Fuchs where, in a man sixty-three years of age, there was a circular groove .5 to 1 mm. in width, which was absent for a distance of 3 mm. up and in. The surface was glistening, and covered by thinned conjunctival limbus. The peripheral wall rose gradually and terminated in the sclerocorneal margin. The central wall was bounded by the saturated white arcus. In the fellow eye there was a similar but less extensive groove. Two years later the circle was complete in O. D. and somewhat bulging. In O. S. the groove had become complete, but at the corneal margin it was even with the cornea because of bulging of its floor.

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ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

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Facts, Old and New, About the Lacrimal Apparatus.

BLAAUW, E. E., Buffalo, N. Y. (*Ophthalmology*, July, 1910), gives a resume of the progress of this branch of ophthalmological science from the remotest time and discusses recent theories and discoveries. The question of the innervation of the lacrimal gland remains obscure. Experiments on animals have proved of no value in this connection, but clinical observation shows that if the facial nerve is paralyzed above the ganglion geniculi, the patient loses the power to weep psychically. The most probable course of these excito-lacrimal fibers, which are found in the facial nerve, seems to be as follows: From the nucleus of the glossopharyngeal nerve, fibers go through the pars intermedia Wrisbergii into the facial nerve root, with which they leave the brain. From the ganglion geniculi they pass through the nervus petrosus superficialis major to the ganglion sphenopalatinum and so to the trigeminus. From this ganglion some fibers may go directly in the second branch and in the nervus subcutaneous malae, which forms a regular anastomosis with the N. lacrimalis, out of which fibers go to the lacrimal gland; while others run backward in the second branch toward the ganglion Gasseri and out of this they progress into the first branch. But the glossopharyngeus does not seem to be the only excitolacrimal nerve. There seems to be an additional innervation by the sympathetic, which directly influences the glandular cells. The center for the psychical production of the tears seems to be the optic thalamus. This is, according to Nothnagel, at the same time the center for the sympathetic, which is innervated at the same time with the crying and the center for the central pain. Neonati do not shed tears, because the cerebral tracts are not yet fully developed. Schirmer, who has made a most exhaustive study of this subject, estimates that the total amount of tears produced in the sixteen waking hours is from ½ to 2-3 grams of tear fluid, functional excitations being absent. Halben found that a real papilla lacrimalis, as described by many authors, does not constantly exist. The canaliculus begins with a very small funnel which dilates from its end, until it reaches its width on bending in its horizontal part, namely 1.5 to 2 mm. The vertical part is about 1.25 mm. long. In its horizontal part it is a cleft, flattened from above downward, and with the walls in contact when at rest. From the puncta to the nasolacrimal canal the lacrimal tube is enclosed in elastic fibers, intricately interwoven. In adult life the inner wall of the canal is smooth, although duplications and diverticula sometimes remain from foetal life and a thickening remains at the narrowest part, where the sac goes over into the canal. The lumen is a capillary slit. There have been many theories as to the mechanism of removal of the tears, all of which fail to explain satisfactorily the phenomenon. Anatomy teaches that with blinking and with lid closure the fibers of the orbicularis, which originate from the internal palpebral ligament, pull the lid forward while contracting. This causes the adherent external sac wall to follow in the same direction, which dilates the lumen of the sac, as the nasal wall of the sac is immovably connected with the underlying bone. The velocity of the tears through the lacrimal canal is not over 1 mm. in the minute. The drainage of the tears may be interfered with by obstructions in the canal. There is a distinction between permeability and physiological condition. Fluid from a syringe may pass freely through the canal, but the tears may not be properly carried to the nose. Swelling of the mucous membrane, small quantities of mucus, even incomplete stenosis, will give way to the syringe, but are decided hindrances to the passage of the tears. Many of the disturbances which lead to epiphora and its consequences are due to conditions of the nose which alter the nasal duct, like deformities of the septum, adenoids, hypertrophied or malformed turbinates, and sinus suppuration. In case of facial paralysis the impediment to the flow of tears is at its origin, due to the fact that the orbicularis does not act. Extensive slitting of the canaliculus is unfortunate, because it weakens or destroys the function of the internal canthus ligament which is so intimately connected with the function of both the canal and sac. Probing with large probes is denounced. Probes up to No. 3 are sufficient for all beneficent purposes. Often permanent drainage is more efficient than long continued probing, particularly in chronic or destructive conditions of the canal or nasal cavities. Medicated threads may be allowed to remain in the canal for a considerable time or a dacryocystorhinostomy may be performed for the relief of the obstructed drainage. A. F. A.

Plexiform Angiofibroma of the Eyelids.

Meyerhof, Max, Cairo, Egypt (*Ophthalmic Record*, June, 1910). This patient, a girl sixteen years old, was seen by the writer in July, 1909. Six years previously a bluish spot had appeared on the upper left lid, and in three years had grown into a tumor which completely covered the eye. Two attempts with actual cautery failed to extirpate the growth. The tumor formed an irregular, lobular mass involving the whole of the left upper eyelid and had invaded the tissues about the external angle and the temporal portion of the lower lid. In the upper lid the mass measured 2x4 cm., and was about 1.5

cm., thick. It was soft and became reduced in size on pressure. Pressure caused no pain. The inferior portion affecting the cheek and lower lid measured 3x2.5 cm., and was not compressible. The eyeball was normal, the vision in each eye 5/7.5, with —4D. There was a slight mucous discharge from the conjunctiva. On July 13, 1909, most of the tumor was excised under chloroform and the wound healed after seven days. Two secondary excisions under local anaesthesia to remove the small remaining portion were made on July 31, and a week later, electrolysis of a superficial vein in the cheek was performed. The cosmetic effect was very satisfactory; the visual acuteness remained the same, and binocular vision was re-established when the left eye was uncovered.
O. W.

Report of a Case of Epibulbar Sarcoma.

VEASEY, C. A., Spokane, Wash. (*Ophthalmology*, July, 1910), gives a case record of a woman of 40 years whose family history for cancer was bad; the essential points of which are, 1st. The appearance of an epibulbar sarcoma at the site of a penetrating injury from a slate pencil, received twenty-four years before. 2nd. The removal by excision upon four different occasions, each time followed by recurrence. 3rd. Enucleation six years after the first appearance of the growth, and no symptoms of recurrence, either local or metastatic, after a period of sixteen months.
A. F. A.

The Pathogenic Element of Trachoma.

ADDARIO, Palermo (*Archives of Ophthalmology*, July, 1910) describes Prowazek's bodies as follows: They are found in the cell protoplasm of the conjunctival epithelium of the upper tarsus, one in each preparation rich in epithelial cells. The form may be spherical, oval, crestlike, or like a stiff hat. They vary in size, but are never as large as the nucleus. They lie about the cell nucleus, just separated from it usually by a line of protoplasm, sometimes by a layer of a certain thickness. Their color, stained with Giemsa solution, is violet or reddish-violet. Their appearance is almost granular and frequently wrinkled, so that they remind one of little mulberries. The contents can be differentiated distinctly into two parts: a uniform ground substance of reddish-violet color and very minute dark granules which resemble blue or dark red cocci or diplococci embedded in the ground substance. He describes the blastomycetae of trachoma as follows: The material is hardened in sublimate and stained with Heidenhain's iron haematoxylin when the blastomycetae are stained intensively and uniformly black even when the decolorization has been carried so far that only the nuclear granulations of the tissue cells retain their stain. The question of the etiology of this disease receives light from this study so far as the hyaline bodies are explained. In the neighborhood of the follicles in the most superficial layers of the parenchyma of the cornea, particularly where the cell proliferation is the liveliest, lymph spaces are to be seen, the lumina of which are filled with heaps of elements of different sizes stained black, some oval, some round, some kidney shaped, some joined in pairs. Each body presents a distinct membrane showing a double contour intensively stained by eosin. In the peculiar follicular tissue of the pannus crassus, and particularly in the interstices which separate the large lymphocytes of epithelioid appearance, are encapsulated blastomycetae, most often singly. Very minute oval forms are also to be seen here of about a quarter the size of the nucleus of the lymphocyte. Each of these elements is enclosed in an enormously thick capsule with concentric layers, which is easily stained with eosin. The presence of this membrane, the bud formations, the polymorphism and their very different sizes leave no doubt that they are blastomycetae.

H. G. G.

Bacteriological Examination of the Conjunctival Sac Previous to Cataract Extraction.

GRADLE, HARRY S. (*Archives of Ophthalmology*, July, 1910), tabulates the results of the examination of fifty cases, in which he considers only the streptococci. These he believes are of greatest importance on account of their being the chief cause of post-operative infection, classing all other microorganisms under the head of "other bacteria." The organism mentioned was found in 29 cases, in 16 of these streptococci were found in smears, while in two of the twenty-one culturally sterile cases streptococci were found in smears where they failed to show by cultural methods. In nine of the fifty cases, other bacteria were found in culture, while in only four cases were these bacteria found in smears. Thus these results agree (bacteriologically positive or negative) in 27 cases, giving a percentage of 54. In 32 cases a bandage was applied from 2 to 12 hours, but in only three cases were bacteria found after the bandage was removed where previous search had not revealed them. H. G. G.

On the Etiology of Bilateral Congenital Corneal Opacity, With a Report of Three Cases.

SEEFELDER, Leipsic (*Archives of Ophthalmology,* July, 1910), found vascularized corneal scars in two cases, and a complete loss of the cornea in the third. He describes his cases in detail and believes that his findings prove without doubt that the eyes were affected during intrauterine life by severe inflammatory processes. The most probable factor in the etiology he believes to be bacterial infection, the pus germs reaching the cornea through the amniotic fluid, or, by metastasis, through the general circulation. He goes on to say that in view of the fact that we have so far no clear case of congenital ulcer of the corneal surface, while undoubted histological data prove the existence of congenital inflammatory affections of the posterior wall, he is inclined to the view of Gallenga and Terrien, that the larger part of congenital leucomata of an undoubtedly inflammatory nature are due to a pre-natal inflammation of the anterior uveal tract with simultaneous or consecutive involvement of the cornea and he does not hesitate to attribute the opacities noted in his three cases to the same cause. H. G. G.

Repair of the Cornea.

KOYLE, F. H., Hornell, N. Y. (*Ophthalmology,* July, 1910), reports a case in which the outer and lower third of the cornea had been ablated down to Descemet's membrane with generally clean cut and sharply defined edges. There was no sign of cell regeneration after several days. There was, however, a well marked Descemetocele with plus tension and some intra-ocular distress. A paracentesis was done and with its recurrence it was repeated and a bridge of conjunctiva was taken from below, brought over the ablated area and anchored with enough tension to support the weakened tissue against internal pressure. Complete union and adhesion resulted and, except for intercurrent and repeated increased tension, which was relieved in the usual way, complete healing resulted. An artificial pupil may restore useful vision later. A. F. A.

Ophthalmia Nodosa.

Parker, Walter R., Detroit, Mich. (*Jour. A. M. A.*, August 20, 1910), reports a typical case of this disease with an unusually good abstract of the literature on the subject. The caterpillar from which the hair came in his case was a bombyx rubi. M. L. F.

Hyaline Degeneration of the Cornea.

Rubert, J., Kieff (*Archives of Ophthalmology*, July, 1910), describes in detail three cases, and finds that by comparison they all resemble the clinical picture of those quoted from the literature. In all there is a peculiar new formation of tissue in the cornea which appears to be a grayish yellow or yellowish white deposit raised a little above the level of the rest of the cornea, from which it is differentiated more or less sharply. The surface is slightly rough, with here and there little vessels coming from vessels in the bulbar conjunctiva, the latter slightly injected in the neighboring parts. The process may in severe cases cover almost the entire cornea. In all of the writer's cases there was a superficial, somewhat vascularized opacity of the uninvolved portion of the cornea. He believes the development was from the pannus which was present in his cases. The deeper parts of the eye appeared in all cases to be unchanged so far as an examination was practicable. The corneal change naturally reduces the vision and the prognosis is bad in every case. Histologically, his cases all differ more or less from each other. In common they all show a special tissue change manifested in the appearance of a homogeneous substance, sometimes in the form of single structures, sometimes in the form of bands. In two cases the substance stained with the basic as well as with the acid dyes. The reactions for amyloid were always negative. He does not hesitate to designate the substance as hyaline, while he strongly differentiates it from keratohyaline and colloid. The changes in the vessels are shown in general by a marked thickening of the walls and a gradual transformation of the latter into a hyaline, structureless substance. In one of his cases the upper layers of the epithelium were cornified in places and formed homogeneous masses which are to be classed as keratohyaline. This is not mentioned by other observers. In two of his cases there was a hyaline degeneration of the corneal lamellae. In all of the writer's cases, as well as in all others reported thus far, trachoma has been present. H. G. G.

Transient Complete Opacity of the Cornea Following the Use of Obstetrical Forceps.

Green, John, Jr., St. Louis, Mo. (*Ophthalmic Record*, July, 1910), saw the patient, a boy seven days old, first on June 20, 1909. Immediately after birth it was noticed that the baby's right eye was unnaturally white, with the right eyelids considerably swollen, a condition which remained up to the time of the first examination. The baby was born on June 13, after a prolonged labor terminated by forceps.

The right cornea was opaque, of a milk white appearance, save for a very small annular rim which, though infiltrated, permitted a dim view of the iris. Both eyes could be opened and closed normally. The position of the forceps blades was shown by deep indentations and lacerations of the scalp from the upper part of the frontal bone on the right side down to the right superior orbital margin. These marks showed that the rounded end of the forceps had lain directly across the eyeball. The cornea had the appearance of a dense leucoma without surface distortion. Dionin, 5 per cent solution, was prescribed for use every three hours, and hot applications were ordered twice a day. On July 6 the cornea had cleared at the periphery, though still presenting a fairly dense white infiltration centrally. The progress of the clearing has continued. Now there is a faint central nebula of the cornea, roughly quadrilateral, extending from the upper to the lower third and traversing the pupillary area. The later treatment has consisted of massage with yellow oxide of mercury ointment, alternating with 5 per cent dionin ointment. O. W.

Ring Ulcer of the Cornea Followed by an Apparent Incipient Ectasis of the Central Portion.

Charles, J. W., St. Louis, Mo. (*Amer. Journal of Ophth.*, May, 1910), reports a case of ring ulcer of the cornea followed by ectasis of the central portion. The patient had been suffering from grippe and had felt that a foreign body was in the right eye for six days. Examination revealed a ring ulcer on the nasal portion of the right cornea. The discrete infiltration in advance of the main furrow had extended around 4/5 of corneal periphery. Centrally, from the position of the furrow, the cornea was cloudy over one-half of the fairly dilated pupil, so that Charles considered the case hopeless. When blood vessels began to appear, they came from the temporal side instead of following the lesion. The progress of the ulcer was checked and the patient disappeared in a few weeks, before an examination of the refraction could be made. No bacteriologic report was recorded.

Four years later the patient reappeared with a ring infiltration of the nasal quadrant of the left cornea, 4 mm. long and ½ mm. distant from the limbus, with one separate focus advancing from either end above and below. By the third day the infiltration had covered 2/5 of the corneal periphery, the corneal surface remaining intact a few days longer. Culture from the ulcer at this time gave a pure staphylococcus albus. Nearly a month later the ulcer was rapidly filling in.

O. D. w + 75 C. axis 90=15/15.
O. S. w + 75 C. axis 90=15/38.

Nearly two years later Charles again saw the patient with a beadlike infiltration on the outer quadrant of the right cornea, in the formerly clear fifth. Recovery was prompt.

After another interval of over two years the patient was seen again when she had groups of marginal phlyctenules at the inner lower limbus of both eyes. Recovery was prompt.

O. D. w — 2. C. axis 175=19/15 +.
O. S. w — 2.5 C. axis 180=19/15.

The right corneal periphery was still slightly opaque and depressed while the pupillary area was prominent as if a glass bead had been imbedded in the corneal tissue. This Charles believes to explain the refractive changes, since no lenticular changes could be made out. There was no trace of the blood vessels formerly present over the now clear corneal tissue.

About one year ago he saw a case of ectatic clear cornea.

and he believes that in such cases, from some unknown cause, a degeneration at the limbus causes a uniform weakness in the resistance of the cornea to the normal tension of the globe. G. H. W.

Cataract Absorption—With Report of a Case.

MacWhinnie, Morgan, Seattle, Wash. (*Ophthalmic Record,* May, 1910), reports the case of a man 40 years old, who was referred to him by a physician, with a history of the eyes becoming tired very easily during the previous three or four years, particularly when used for near work; he could read newspapers easily during the day, but at night this was impossible. Four years previously he had had a specific infection, and was treated intermittently for three years by internal administration of mercury. The left eye showed a small amount of vitreous opacities with a distinct chorio-retinitis. The vision of the two eyes with the mydriatic was respectively 6/vi — 1 and 6/xv. The patient was informed that local as well as systemic treatment might cause a partial absorption of the lens opacities, and he was referred to his physician with instructions to use mercury to saturation. He did not return for local treatment, but was treated by his physician with injections of benzoate of mercury, one cgm. daily for twenty days. He then returned for examination, which showed that the sectoral opacities of the left eye had disappeared, with vision 6/vi — 3, and Jaeger 1 at 15", no correction being given. The condition of the right eye was also much improved. O. W.

A New Forceps for the Removal of the Anterior Lens Capsule.

Tooke, Frederick, Montreal (*Ophthalmic Record,* May, 1910). This instrument is described as being L-shaped, the handle tapering towards the end and being about 8 cm. long. A buffer pin in the center of one handle fits into an aperture in the arm of the other handle. A shoulder on this pin prevents undue pressure on the extension blades. The arm of the L and the extension blades are made of finely tempered steel welded to the handles at an angle of 120 degrees. The extension blades are used within the anterior chamber, they are curved concavely below, the degree of concavity being obtained by measurement of a series of human lenses. At the toe and heel of these blades are two sets of interlocking teeth which allow the operator to obtain a free hold on the underlying capsule. O. W.

An Unusual Case of Vossius' Lens-Ring.

Gifford, H., Omaha, Neb. (*Ophthalmic Record,* August, 1910), reports the case of a boy, eleven years old, who had suffered an injury to the right eye from a fragment of a dynamite cap which exploded in his hand. The wound of the eye was a non-penetrating one of the inner limbus and the adjacent conjunctiva, flat, ⅛ of an inch in diameter, and covered with grayish exudate. A corresponding area of the cornea was cloudy. There was a little blood in the anterior chamber, and the eye was so irritable that a careful examination with the ophthalmoscope could not be made until the next day when, the pupil being fully dilated, a ring shaped opacity, composed of densely crowded fine points, about 3 mm. in diameter, was visible in the center of the anterior surface of the lens. There were also visible, through the anterior surface of the lens, innumerable fine opacities which extended to the periphery. Oblique illumination failed to show either the ring or the other opacities. Eighteen days later the ring was breaking up, but it was still possible to see the outline as well as the fine dots in the rest of the lens. Except for this and a stringy opacity in the vitreous the eye was normal. Vision with correction was $=20/30+$. O. W.

Ossification of the Hyaloid Membrane.

Vassiliades, Nickolski (*Ophthalmic Record*, September, 1910). The case described in this article was that of a Turkish officer, aged thirty-five, who had phthisis bulbi of the left eye and ciliary pains in the right. Ten years previously he had had a purulent ophthalmia, which resulted in atrophy of the left eyeball. Four years later he began to suffer from periorbital pains in the left eye, which resisted all treatment, and finally attacked the other eye. Coming under the care of the writer in the military hospital at Beyrout, it was decided to enucleate the left eye.

On sectioning the globe a brown fluid escaped, the cornea collapsed, and the lens, small, calcified, and partly covered with a portion of the iris, fell out. There was also exposed a hard, round substance having the same form as the intraocular membrane. A careful microscopic examination of the hardened tissue showed there were present all the essential elements of bone. O. W.

An Example of Leber's Disease.

Clemesha, J. C., Buffalo, N. Y. (*American Journal of Ophth.*, May, 1910), after a brief resume of Leber's disease, describes the ocular conditions of a family in which congenital optic atrophy was found in three of the children, all boys. The atrophy was complete in two, in the third the vision was 20/200 and unimprovable. The mother had 20/70 vision improved to 20/40. In all the cases, the three boys and mother, the disks were white, the arteries and veins small, and the media clear. There were four daughters in the family, none of whom were affected. G. H. W.

A Case of Choked Disk Possessing Some Unique Features.

Harris, C. M., Johnstown, Pa. (*Ophthalmic Record*, September, 1910), reports the case of a man thirty-five years old who had been struck on the right eye with a board several weeks previously. The wound had healed promptly. Mental dullness and diminution of sight and hearing were noticed later, and for three days the patient had severe attacks of vomiting. Both papillae were oedematous. At the operation the skull was exposed at and above the supraorbital region, but no evidence of a previous opening was seen. The removal of a plate of bone revealed an abscess in the substance of the frontal bone in which lay a partly disintegrated piece of wood which had penetrated the roof of the orbit posterior to the supraorbital region. The debris was removed, the cavity cleansed, and recovery promptly followed, including improvement in both sight and hearing.

About eighteen months later the vision in the right eye was 6/12, that in the left eye 6/5, whereas before the operation the vision in the right eye was 4/21 and in the left 5/6.

O. W.

Methyl Alcohol Amblyopia; Clinical Records and Historical Study.

GRUENING, E., New York (*Archives of Ophthalmology*, July, 1910), reminds us that the use of methyl alcohol in the preparation of spirituous liquors is at the present time so widespread that the best efforts of the physician, the sanitarian, and the economist will be needed for its suppression. During the past year he has observed ten cases of methyl alcohol amblyopia in his clinic and in private practice. Two of these showed notable divergences from the recognized type, and he considers them worth reporting. The first case was that of a young man who became totally blind after partaking of a large quantity of wine purchased from a peddler. The examination revealed double atrophy of the optic nerve, maximum dilatation of both pupils without reaction to light, vision nil. The patient was treated for two months with iodide of potassium, strychnine, pilocarpine, and Bier's method. In both optic disks excavations resembling those of glaucoma formed under his observation, without apparently increased tension. The vision improved to R. 1/20, L. 1/200.

In his second case, a bottle or more of whiskey had been drunk, and the patient, forty-four years old, awoke blind in the morning. There was maximum dilatation of both pupils, the optic nerves were white with veiled edges, sheaths of connective tissue surrounded the veins and arteries, and there was no perception of light. In this case it was found that the patient had partaken of methyl alcohol for some months past. Under treatment, after a slight improvement, the sight retrograded to R. 1/200, L. 1/40. He believes that this was a case of chronic poisoning with acute exacerbation, because of the presence of connective tissue in the nerve and surrounding the vessels, which is rare in acute methyl alcohol ambylopia. H. G. G.

Alternating Illumination.

BLACK, NELSON M., Milwaukee, Wis. (*Ophthalmic Record*, July, 1910), refers to the paper of Mr. Albert J. Jackson, under the above title, in the March issue of the *Illuminating Engineer*, in which a suggestion is made that "eye tire" from artificial illumination could be eliminated if the eye were exercised and the waste matter, which is constantly being collected, thrown off. He also refers to Marshall's suggested experiment for involuntary exercise of the muscles of the eye when the eye is endeavoring to work under such conditions. This experiment is described thus:

"In a room where a uniform illumination of 2-foot candles is obtained on a horizontal plane equal to the average height of the eyes of persons while in a sitting position, attach to the lighting circuit a dimming device which would vary the illumination intensity, say from 1-foot candle to 2-foot candles, by exceedingly minute steps throughout a period of 15 minutes, so that the eye by adjusting itself to this varying intensity of illumination, would exercise itself without the brain being conscious of such action, and observe whether this 'internal massage' assists in maintaining the elasticity of the muscles of the eye and in elimination of the 'eye tire' and headaches which so often result when persons are compelled to stay any great length of time in a room too uniformly illuminated."

Referring to this experiment, Black says that the test types used by him are engraved on porcelain, and are transillumined, the electric current passing through a rheostat with which the intensity of the illumination may be controlled. He has found that changing the intensity of the illumination during a prolonged examination with or without a cycloplegic has afforded the patient relief. His opinion is that the exhaustion of the visual purple caused the tiring, and that the reduction in intensity of illumination gave a chance for its renewal.

O. W.

A One-Degree Astigmatic Scale.

Rhoads, J. N., Philadelphia (*Ophthalmic Record,* May, 1910). Attention is called to the cut illustrating this article in which the scale is marked with lines one degree apart. This new scale has been extended to a complete circle, which is regarded as an innovation. To get an axis approximating 60 degrees the other side of the frame can be used and a full swing obtained. This scale has a traveling index fastened to the revolving cell which holds the cylinders in the frame. This index is three-eighths of an inch long, and points and travels over the scale with its distal point, while the inside point lies exactly under the diamond scratch which marks the cylinder axis. The writer also describes a narrow V-shaped notch in the cylinder rings, adjacent to their axes, which serves to place the cylinder in juxtaposition with the index with greater certainty and to keep the cylinder in position. In connection with this notching of the cylinders he has placed a small knife-edged pin in the center of the index, which securely locks the pin in position. O. W.

Glaucoma After the Extraction of Cataract.

Chance, Burton, Philadelphia (*Ophthalmology,* July, 1910), says that occasionally a total and persistent abolition of the anterior chamber with great increase of tension follows the operation for the extraction of cataract, whatever method of extraction may have been employed. The origin seems always to have been some obstruction of the filtration angle. It may occur from the swelling of remnants of the cortex, from the displacement and tension of the capsule, from a plastic iritis, or from a faulty technique, and is rarely, if ever, from any inherent tendency to glaucoma in the eye itself. Again, the epithelium of the cornea may proliferate into the anterior chamber and line the cavity, thus preventing filtration, or a membrane may close the pupil and thus prevent the transfer of fluid from the posterior to the anterior chamber. This form of glaucoma usually defies all treatment and results in entire loss of vision. The usual efforts should be made to reestablish the anterior chamber, clear the filtration angle, and establish communication between the anterior and posterior chambers. A. F. A.

A Suggestion for an Operation for Chronic Glaucoma.

Denig, R., New York (*Ophthalmology,* July, 1910). To effect a leakage between the anterior chamber and the subconjunctival space a conjunctival flap 3 mm. wide and 2 or more cm. long, extending from the limbus of the superior corneal edge back to the very equator of the eye, is dissected away and the flap is left in place without severing either end, after which the ordinary iridectomy section is made, taking care not to cut off the conjunctival flap. A double armed suture is then passed through the peripheral end of the flap, which is then severed and turned over the cornea out of the way. Next, a perforation of the cornea is made about 2 mm. from the limbus, 3½ to 4 mm. in length, and parallel to the edge of the cornea. The flap is then turned at its base and pulled through the anterior chamber and the corneal wound, and through the loop thus formed the end of the flap is pulled, a knot thus being made, the epithelial layers of the flap resting on each other. The end of the flap is then buried subconjunctivally, the conjunctiva being undermined on both sides, drawn over the wound and closed by sutures. It is essential that the flap be made as long as possible. The essential feature of this operation consists of forming a loop by drawing a conjunctival flap through a perforation of the cornea and thus establishing a leak from the anterior chamber into the subconjunctival space, and this may be accomplished by several modifications of this technique. This operation applies to such cases of chronic glaucoma as do not yield to iridectomy. The flap may be used in place of a suture in cases of cataract extraction where an expulsive hemorrhage is feared. It might also be applied to cases of staphyloma and keratoconus, and possibly in keratoplasty. A. F. A.

Visual Fields in Accessory Sinus Disease.

MacWhinnie, A. Morgan, Seattle (*New York Medical Journal*, August 13, 1910), declares that in cases of accessory sinus disease: (1) The central visual acuity may or may not be diminished, although it is usually lessened. (2) Normal visual fields without scotomata would indicate imperfect perimetric chart, hasty procedure, or indifferent taking of the same. (3) The absence of pus in the nose, with or without proptosis, does not indicate a normal sphenoid. (4) Relative scotomata for red or white are always present, regardless of whether the blind spot is enlarged or not. (5) Contraction of the field of vision always for red, maybe for white. (6) Scotomata disappear before the field enlargement takes place, following operative procedures. He believes that congestion of the fundus and haziness of the cornea in these cases is the result of absorption of toxic products from the sphenoid sinus through the lymphatics. M. L. F.

Ocular Migraine and Disease of the Frontal Sinus.

Oertel, Duesseldorf (*American Journal of Ophth.*, July, 1910), reports a case of ocular migraine due to nasal disease. In 1905, having taken cold, the patient had, for the first time, intense headache in the right frontal region, the right eye showing vivid injection of the blood vessels and intense photophobia. The right supraorbital nerve was quite painful on pressure. During the attack there was a slight catarrhal discharge from the nose. From 1905 to 1907 such attacks appeared about twice a year, having a prodromal stage of pulling pains in right eye with pressure over the eye of several hours and lasting from two to three days. They then increased in frequency, and in 1909 occurred about every month. The headaches and eye symptoms had increased in severity, while the attacks lasted fully six days. There was no fever.

On November 19th, 1909, Oertel first saw the patient, who had been sent by an ophthalmologist for examination. Examination of the nose showed the nasal passages to be free from pus and mucus. The right middle turbinate was strongly developed and touched the septum, while its lower free edge rolled so as to leave a very narrow passage between it and the lateral wall. No evidence of disease of the mucous membrane or the sinus was found, and the patient was asked to return when the prodromal stage of an attack appeared. On December 7th, 1909, the patient reappeared. The right eye showed considerable injection with lacrimation, and photophobia. The vision was misty, and the pain in the right frontal region was intense. The anterior wall of the frontal sinus was very painful on percussion. On intranasal examination the mucous membrane of the lower turbinate was red and swollen, with some mucous secretion in the inferior meatus. The mucous membrane of the middle turbinate looked glassy and swollen with thin fluid mucous appearing between its free margin and the lateral nasal wall. Post-nasally mucus was seen flowing down the posterior edge of the middle turbinate.

Oertel then resected the bent margin of the middle turbinate and opened up the bulla ethmoidalis. Not being able to pass a probe into the frontal sinus, several of the anterior ethmoidal cells had to be removed. During the following hours much mucous secretion flowed out, the patient being entirely comfortable within three hours. Six months have passed with no new attack. G. H. W.

The Importance of Prompt X-Ray Examination in Cases of Penetrating Wounds of the Eyeball, Where the Foreign Body Can Neither Be Seen Nor Accounted For.

RANDOLPH, ROBERT L., Baltimore (*Ophthalmic Record,* July, 1910), refers especially to cases in which the foreign body cannot be seen in the anterior chamber. iris, floor of the vitreous, or retina. In many of these cases a minute particle of iron or brass is embedded in the ciliary region, and cannot be detected by the ophthalmoscope, or it has gone through the anterior structures of the eye and vitreous and is embedded in the retina. while the cloudiness of the vitreous often makes it impossible to detect the situation of the foreign body. and in many cases the reaction is so slight that it is hard to believe in the presence of a foreign body. He cites the following case as illustrative of his theory:

A man forty-eight years old consulted him, saying that he had been struck in the eye the previous evening. He was suffering slightly and there was a slight redness over the region of the internal rectus. His vision was not impaired. No wound could be seen and he was quite sure nothing had entered his eye. A dilated pupil showed a clear vitreous and normal eyeground. He was told to use cold applications. He returned next day and said he was much better. Two days later he returned, having passed a bad night and suffering intensely. There was pericorneal redness, and vision was less than 20/40. Vitreous cloudy. On Wednesday he was subjected to an X-ray examination, which revealed two very small foreign bodies embedded in the ciliary body.

O. W.

A Series of Studies of Nervous Affections in Relation to the Adjustments of the Eyes.

STEVENS, GEORGE T., New York (*New York Medical Journal,* October 15, 1910), reports a case of violent chorea that had lasted fourteen years in a boy sixteen years old. Previous treatment had failed. He says:

"The ophthalmoscope showed no lesion. Without repeating the details of several examinations made on as many days, the other conditions might be summed up as follows: Vision of each eye 6/6, right without glass, left with cyl. + 1.25 axis 90°. Hyperphoria=0; esophoria=16°, deviation in exclusion corresponding to the esophoria shown by the phorometer. Rotations were all free and normal but the rotation upward of 42° was in excess of the most favorable rotation in that direction. *Declinations, right* + 1°, *left* + 6°. The boy could see single, but images were confused when both eyes were open and the interposition of a faintly colored glass before either eye induced diplopia.

Treatment. Here too we may condense the daily records to a general statement. The correction of the *declinations* was the aim of all the efforts to correct the adjustments. No treatment was instituted directly against the esophoria, for in case the declinations could be corrected there was no reasonable doubt that the esophoria would correct itself. The treatment was surgical, consisting of operations to which I have given the somewhat contradictory designation of *extendocontraction* of a tendon.

A few years since all my efforts would have been directed against the esophoria and the essential defect, the declinations, would have remained uncorrected. The operations would perhaps have consisted of tenotomies, a class of operations which I now rarely perform."

Within about a year seven operations for declination were performed. There was, at first, a rapid and then a steadily progressive improvement. While, during the early weeks of treatment, moderate nervous attacks occurred from time to time, as the months progressed these days of restlessness became progressively less frequent, until during the last few months no return of the malady was observed. A year later his mother stated that he was well, and again later his brother said that he was well and at work. M. L. F.

A Few Notes on Ophthalmic Surgery.

Dean, G. Edgar, Scranton, Pa. (*Ophthalmic Record,* June, 1910), avoids operating in cases of moderate glaucoma superinduced by eye strain by using a four to six-cell galvanic current with the negative pole to the eyes and the positive to the back of the neck—a mild stable current continued for ten minutes, and repeated *pro re nata.* Glasses were prescribed when the eyes could be safely examined.

For pterygium he dissects back the diseased tissue to its base in the usual manner, then makes a vertical incision of the conjunctiva near its corneal attachment, then draws together and sutures the horizontal edges of the conjunctiva, and finishes by placing the wire loop of a galvanocautery over the muscular flap of tissue and *burning it off* at its base.

In operations for hyperphoria he has found that if the operation is performed on the *inferior* rectus of the opposite eye the probability of permanent results is more than doubled.

For treating corneal ulcer with hydrogen peroxide he first cocainizes the eye and then applies the hydrogen peroxide, full strength, on cotton, to the ulcerated point, holding it there long enough to allow the solution to penetrate the deeper layers of the cornea.

In suturing a wounded eye he employs a double set of fine catgut sutures—first suturing the sclera and then the conjunctiva separately. O. W.

Supraorbital Neuralgia—Two Cases.

Dowling, J. Ivimey, Albany, N. Y. (*Ophthalmology*, July, 1910), reports two cases in which supraorbital pain was not relieved by the proper use of correcting glasses, and which were relieved by the removal of growths from the nerve at the foramen. The first growth was a concretion formed from the secretions of an enclosed hair follicle. The second was an exostosis resulting from a previous fracture of the wall of the foramen. A. F. A.

Large Piece of Wood Embedded Deeply in Orbit of Child Twenty-five Months Removed with Preservation of Vision.

Veasey, C. A., Spokane, Wash. (*Ophthalmic Record*, August, 1910), removed a piece of wood 2½ cm. long from near the sphenoidal fissure in the orbit of a boy four years old. It had been embedded twenty-five months and had not irritated the optic nerve, though it had lain so long in close proximity to it. O. W.

The Influence of Pregnancy and Labor Upon Diseases of the Eye.

Fejer, Julius, Budapest (*Archives of Ophthalmology*, July, 1910), calls attention to the fact that there is nothing in the literature regarding the effect of pregnancy on multiparae with high myopia of both eyes and central chorioretinitis. He describes the case of a woman thirty-five years old, who had high myopia, increasing greatly after each confinement. In consultation he found it justifiable to induce abortion. During the three years that have since elapsed the myopia has not progressed. He believes that the nine months of disturbed metabolism, the clogging of the circulation of the blood, the straining during parturition, and particularly the abdominal pressure upon the patient, cannot be irrelevant to the easily distensible eye. H. G. G.

Ophthalmic Studies in Chronic Interstitial Nephritis.

Peter, Luther C., Philadelphia (*New York Medical Journal*, August 20, 1910), presents an interesting study of a number of cases and comes to the following conclusions:

1. Increased blood pressure is probably the chief cause of eye changes found in chronic interstitial nephritis.
2. Defective elimination may also play a part in their production, but is more closely related to the toxic symptoms of the eye.
3. Eye phenomena are an aid to diagnosis and prognosis in this form of chronic Bright's disease.
4. In order to prevent, if possible, the more serious forms of eye changes, an early diagnosis is necessary.
5. In diseases involving the renal and arterial systems, a joint study by internist and ophthalmologist is productive of the greatest amount of good to the patient and to the physician. M. L. F.

Colored Toric Glass for Use in Examining Cases of Ocular Paralysis.

Byers, Gordon M., Montreal (*Ophthalmic Record*, July, 1910), says, referring to the custom of placing a red glass before a patient's eye in making a differential diagnosis of ocular paralysis, that the colored glass usually taken from the test case is often unsatisfactory, as in the lateral ocular movements the vision of the eye before which the glass is placed first strikes the rim of the lens and then passes beyond it out of the colored field, thus confusing the patient, and making it difficult, both for him and the examiner, to accurately place the image. To remedy this defect the writer has adopted the use of a large, perfectly ground toric lens of a rich red color, rimmed and furnished with a handle; the wider color field almost eliminating the difficulties previously experienced in these examinations. O. W.

Device for Pneumo-Massage of the Eye.

Eaton, F. B., Portland, Ore., (*Ophthalmic Record*, July, 1910), describes a device intended as a substitute for the apparatus used by Dr. Würdemann for massage. It consists of a hard rubber Siegel otoscope, the top lens of which has been removed, and replaced by a double piece of dentist's rubber dam stretched across and tied in place. A hole is then cut in this, leaving a margin of ⅛ inch. It is then placed over the eye, its edge fitting closely around the anterior half of the globe, and the tube of the otoscope connected with the ordinary pump ear masseur. The forefinger closes the end of the otoscope and serves to gauge the amount of suction and repulsion. O. W.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(GREAT BRITAIN AND THE ENGLISH COLONIES.)

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Sloughing Corneae in Infants—An Account Based Upon the Records of Thirty-one Cases.

STEPHENSON, SYDNEY (*Ophthalmoscope,* November, 1910) The author carefully reviews the literature of his subject, and reports thirty-one cases from his own practice.

The disease was first described in 1827, by Joseph Brown, under the title "A Case of Ulcerated Cornea, from Inanition." Mackenzie refers to the condition as one that he has repeatedly seen in infants, emanating from various causes, such as measles, hydrocephalus and syphilis. Two of the author's cases were due to disseminated tuberculosis.

This destructive form of keratitis, associated with xerosis of the conjunctiva, may be met with in young children of low vitality, in Germany, Russia, Brazil, the East Indies, China, Japan, England, and some parts of America. It occurs in babies who are generally dangerously ill, and occurs, according to the author, in one per thousand of the eye cases attending a children's hospital in London.

Keratomalacia is described as a disease of children whose ages range from one month to twenty months, it being quite as rare above as below these limits, the average being 4.54 months. Both sexes are affected about equally. In the author's cases 41 per cent were males, 52 per cent females, 3 per cent, sex was not noted.

von Graefe attributed keratomalacia in infants to encephalitis, and Hirschberg held the same view. This theory now finds but little support since the diffuse infantile encephalitis of Virchow is now regarded as non-existent.

The relationship between diet and keratomalacia has not been well established. As the author forcefully says, "If it were a question of diet, the disease would be very much more frequent than it is."

Etiology.—All valuable evidence goes to show that the determining factor in the corneal ulceration is to be found in exogenous infection, with a predisposing cause of lowered vitality, and is not to be regarded as a mere local manifestation of a general infection. Without exception the victims of keratomalacia are marasmic.

The connection between keratomalacia, on the one hand, and the disease variously described as "epidemic enteritis," "ilic-colitis," etc., on the other hand, seems to be established, both being most prevalent during the months of July and August. Syphilis was demonstrated in 22.58 per cent of the author's cases; tuberculosis in 19.36 per cent. Whether the tuberculosis was primary or grafted on a pre-existing malady, the author was not able to determine.

The author believes we may have destruction of the cornea in any baby whose nutrition is seriously impaired, whether as a result of disease, semi-starvation, or from any cause whatsoever.

Prognosis.—While the disease has a very high degree of mortality, the author does not agree with those who think that it is invariably fatal. In his cases the mortality amounted to 41.9 per cent. He thinks, however, this figure may be somewhat low, as some of his patients may have died after passing from his observation. The older the baby, the better the chances for recovery. The syphilitic and marasmic cases justify a better prognosis than those due to tuberculosis.

As regards the cornea, the author sums up the symptoms of keratomalacia in four words—*infiltration, ulceration, perforation,* and *cicatrization.*

Both corneae are usually affected, though not necessarily at the same moment or to the same extent. There is first a slight dullness of the epithelium and some part of the lower half of the cornea,.which either clears up under treatment or is replaced by a definite infiltration. This may quickly suppurate so that the entire cornea speedily becomes converted into a soft, grayish-white, pulpy slough. The photophobia is not marked. The whitish appearance of the eye may be the first thing noticed by the baby's friends. Swelling, redness, or spasm of the lids are also not marked. Neither is there lacrimation, chemosis, nor congestion of the eyeballs, nor any of the other appearances that we should naturally expect to find associated with so severe and destructive an infection. The eyes often look curiously dry and are more or less insensitive to stimuli, and can be examined without difficulty. The absence of pain, alone, should arouse suspicion as to the nature of the case, suggest extreme care in handling, and prompt a bad prognosis.

The small, triangular, greasy-looking white patch in an area of so-called xerosis, first described by von Graefe, is a common accompaniment of keratomalacia. It is situated in the ocular conjunctiva at the outer or inner aspect of the cornea. The author has observed that the entire cornea may become encircled by a narrow, slightly raised, glistening white line, the conjunctiva near which is somewhat lustreless, dry, and wrinkled concentrically. It is doubtless due to the lodgment and multiplication "in situ" of the xerosis bacillus, together with a local precipitation of the Meibomian secretion.

If the baby's nutrition cannot be improved, the cornea is likely to perforate. In a second group of cases, secondary glaucoma may be developed, together with an anterior staphyloma. In the third group the cornea becomes prominent without actual perforation having taken place. The result in every case is blindness.

Perforation of the cornea may be followed by marked signs of inflammation, in some cases so severe as to arouse suspicion of a gonorrheal infection. The progress of the disease may be arrested at almost any stage, with a consequent retention of a more or less useful eye.

Diagnosis.—The diagnosis of keratomalacia should offer no difficulty to one who is aware of the existence of the disease. The author holds that ulcers of the cornea, especially if bilateral, in infants between the age of two to twelve months, are far more likely to be due to keratomalacia than any other cause, such patients being too old for the corneal complications of gonorrheal ophthalmia, and too young for ezematous keratitis. The author emphasizes the differential diagnosis between keratomalacia and (1) keratitis xerotica, and (2) trophoneurotic keratitis.

Keratomalacia may be said to be a malady devoid of distinctive pathology or bacteriology.

Treatment.—First, place the baby under the best possible conditions for recovery. The infection is one where careful nursing counts for a great deal, therefore the hospital is obviously the best place for these patients.

The treatment, itself, should be both general and local. General treatment is that suitable for marasmus, with special attention to its etiologic factor. Local treatment includes the frequent use of hot saline or boric lotion and hot boric fomentations, together with argyrol, and quinine, and hydrogen peroxide. The first named has been employed as a 15 to 25 per cent. solution, droped into the eye at frequent intervals; the second as a lotion containing 4 grains of quinine sulphate to the ounce of distilled water, just enough sulphuric acid being added to insure a clear solution. The quinine is freely applied to the eyes every four hours, and in the interval they are kept tied up with gauze soaked in the lotion. Hydrogen peroxide is first an efficient antiseptic and is perfectly innocuous. Secondly, it yields accurate information as to the progress of the corneal ulceration. It may be necessary to separate the baby's eyelids by retractors, to allow a thorough application. The employment of physostigmine, either as an ointment (½ per cent of physostigmine in vaseline), or pilocarpine is indicated. If the gangrene of the cornea can be mastered, the physostigmine should be replaced by an oily solution of atropine. The eye should be tied up with a pad and bandage, and great care should be exercised in making the necessary examinations. W. R. P.

The Bacteriology of Ulceration of the Cornea.

MacNab, Angus (*Ophthalmoscope,* September, 1910). The writer confines his remarks to the principal facts which have been established regarding the influence of different bacteria on the origin, the course, and the treatment of the pathologic processes involved in the formation of ulceration of the cornea. The practical side of the subject is made most prominent.

1. The collection and investigation of material.
2. The varieties of ulcers, classified according to the organisms present.
3. The influence of these findings on prognosis and treatment.

The material must be obtained from the actual focus of the inflammatory reaction, but without causing any dissemination in the sounder tissues around. The densest parts of the lesion should be scraped with a small platinum spud, tube inoculated and smear made, unless perforation seems imminent, when no further investigation along these lines is justifiable.

Material of less value, but still of considerable utility, is supplied by conjunctival discharges and fluids expressed from the lacrimal sac.

Loeffler's blood serum is a good medium for general use. Wertheim's serum agar is perhaps even better, especially for refractory bacteria. It is made by mixing neutral 1 per cent agar with one quarter its bulk of human serum, the best being made with ovarian cyst fluid, and on it even the gonococcus and the Koch-Weeks' bacillus will grow well.

The Gram stain excels all others. The Jadassohn modification is simple and reliable.

The film is fixed in a flame and stained for about 30 seconds in the following: 88 pts. 5 per cent aqueous gentian violet, 10 pts. abs. alcohol, 2 pts. aniline oil. Wash with water, fix the stain with Gram's iodine solution, decolorize in alcohol, wash in water, and counterstain.

Using as differentiating criteria the form of the organism—coccus or bacillus—and the Gram reaction, positive or negative, we obtain four classes:

A. Gram-*negative* bacilli.
B. Gram-*positive* bacilli.
C. Gram-*negative* cocci.
D. Gram-*positive* cocci.

(*a*) The Gram-negative bacilli are again subdivided by culture reactions into—

1. Those not liquifying blood serum—

Bac. Koch-Weeks.
Bac. Influenzae.
Bac. Friedländer.
Bac. zur Nedden.
Bac. Coli communis.

2. Those liquifying blood serum (important in ulcers)—

(*a*) Not fluorescent (large) .... { B. Morax-Axenfeld.
{ B. Petit.
(*b*) Fluorescent (small) ....B. Pyocyaneus.

(*b*) Gram-positive bacilli (unimportant)—

B. Xerosis.
B. Subtilis.

(*c*) Cocci. Gram-negative—

The gonococcus.
Micrococcus catarrhalis.
Meningococcus.

(*d*) Cocci. Gram-positive—

Pneumococcus.
Streptococcus.
Staphylococcus.

One type of ulceration to which all pneumococcus infections of the cornea tend to conform is a serpiginous ulcer.

After a slight injury to the cornea, we find the patient complaining of some obscurity of vision and redness of the eye; a small white spot is noticed in the cornea, and in a few days intense pain may supervene. If the case be seen in the early stages, a small defect is found on the surface, where the epithelium is raised over a dense, white, round, sharply defined infiltrate.

Generally, an ulcer is fully developed when the case is first seen. Then we have a circular shallow surface defect; one part of its circumference is very distinct, forming a prominent lip, underneath which is a dense, yellowish white infiltration; the opposite edge is faint, without an obvious breach in the epithelium, and quite difficult to see unless by a study of the surface reflex. These two parts of the ulcer are termed respectively the "advancing" and the "healing" edge; the former is overhung, is the seat of active progress, where the rapidly growing pneumococci are found in greatest number and the point from which material for examination must be obtained and to which all remedial measures should be applied. The floor of the ulcer can be neglected and, indeed, the application of the cautery to the floor even results in unnecessary destruction of tissue.

Roemer devised a serum treatment in which, by active immunization, he raised the anti-microbic power of the blood, while at the same time he applied immune serum to the ulcer. Unfortunately, results of this treatment, on the whole, have not been any better than those obtained by the cautery.

The sources of infection may be from foreign body, or dirty implement, the sputum or nasal discharge, or the lacrimal passages. The pneumococcus is more frequently found than any other organism in a mucocele, and in these cases the sac should be excised at once, and the lids painted with strong protargol solution.

Streptococcal ulcers do not form in cases of streptococcal conjunctivitis, nor in acute streptococcal dacryocystitis, but appear to occur, as does the pneumococcal ulcer, essentially as a corneal lesion. The ulcer is round, and the margin is irregular and swollen, showing a ragged edge. The base is densely opaque, yellowish-white, and covered with necrotic debris; most of the cases recorded had already perforated. The rest of the cornea is clouded. A well-marked infiltration zone surrounds the ulcer.

The interesting point brought out by the examination of sections of these ulcers was that the streptococci were distributed irregularly in the necrotic debris covering the floor, and in the infiltrated tissues below it. There was no tendency to their limitation to the margin.

The streptococcus is Gram-positive, resembling the pneumococcus in growth, but differing in form.

Ulceration due to the bacillus pyocyaneus is so rare that it is almost outside the range of practice. It is a Gram-negative bacillus which rapidly liquefies blood-serum. This organism seems to have the power of rapid diffusion into the interior of the eye, even causing abscess-formation in the vitreous. With regard to treatment, the strong probability of a panophthalmitis calls for the operation of corneal section as soon as possible.

Ulceration due to Friedländer's pneumobacillus is characterized by the gelatinous appearance of the debris on the floor and their regular spread, producing a round, rather funnel-shaped depression. The hypopyon is great, and the accompanying iritis is of the plastic type. Ordinary antiseptic treatment usually suffices. The pneumobacillus is Gram-negative and grows on solid serum without liquefaction.

The diplobacillus of Morax and Axenfeld and its close relative, the diplobacillus of Petit, are two organisms which appear to be peculiar to the eye and nose. They produce a well-defined form of conjunctivitis, especially affecting the margins and angles of the lids. They can also produce corneal ulcers of two distinct types—the superficial or catarrhal, occurring in the course of a very profusely discharging conjunctivitis, and the deep, or central form, where the conjunctiva is apparently unaffected.

The central ulcer is usually found a few days after some slight injury, which has broken through the epithelial surface; a faint gray infiltrate forms under the epithelium, the surface of which gives way and an ulcer results.

In proportion to its area, the ulcer is deeper than the pneumococcal, the floor shows infiltrated spots, and there is not the well-defined advancing edge of the true serpiginous ulcer.

The bacilli tend to occur in pairs, end-on to each other. They are slightly rounded at their ends and occasionally show capsules. They are Gram-negative and take the counter stain, fuchsin, intensely. Cultures can only be obtained at blood temperature and on media containing serum. The characteristic growth is that on solidified blood-serum, the surface of which becomes excavated in regular depressions, which coalesce and finally the whole medium dissolves.

The diplobacillus of Petit differs in more vigorous growth, which can occur at room temperature and on media not containing serum, as pure gelatin or simple agar.

Ulceration due to Petit's bacillus is generally more severe than that due to the Morax-Axenfeld bacillus.

The treatment consists in the repeated instillations of zinc —2 grains to the ounce giving the best results. The author has recently tried ionization, applying a zinc electrode dipped in zinc sulphate to the ulcer, with a current of ½ milliampere for one minute, with favorable results.

Attention is called also to the progress which serum and vaccine treatment is making with relation to ulceration occurring in acute conjunctivitis. W. R .P.

Retinitis Pigmentosa.

Doyne, Robert W. (*Ophthalmoscope,* September, 1910). The characteristics and treatment of retinitis pigmentosa are taken up in detail, with particular stress upon certain undescribed symptoms and appearances, and the variations which may occur in the earlier and later manifestations. The pathology, diagnosis and treatment are also described.

Among the early symptoms are, inability to see in dusk, torpor of the retina, in which the images take some time to form, and, frequently a remarkable symptom,—slowness of the images to fade when once formed. There may be dazzling in bright light, or a momentary sense of bright light circling round the periphery of the field. As the disease progresses the night blindness increases, but sometimes a remarkable change occurs—the patient who has preferred a condition of good, diffuse light, will cease to be able to read, without great difficulty, by daylight, and will prefer a certain artificial illumination, usually of a very exact degree. One case is mentioned in which bright moonlight was as useful to the patient as daylight. Ring scotoma is a very constant symptom of this disease in the earlier stages. Later the fields become so narrowed that the patient has practically only a small patch of vision before him. Color vision may be quite good. Central vision generally is preserved intact to a late stage of the disease, but there are a few cases in which it is affected quite early. Generally a pigmentation of the retina of a lace-like pattern will be found towards the periphery, but usually at the extreme periphery there is an area of apparently normal retina. As the disease progresses the pigmented zone approaches nearer and nearer to the macular region.

Attention is called to another zone of greyish infiltration, rather the color of powdered slate pencil, just inside the pigmented zone. The optic disk has a waxy appearance, the cup is filled in and the vessels are relatively narrowed.

Opacities of a very peculiar character are described, lying in front of and covering nearly all of the retina. They appear as interlaced, fine opalescent threads, resembling the gossamer seen on an autumn morning over a turnip field. The material sometimes appears in masses or chunks, but more often it requires careful search to discover it. The author is disposed to favor the view that the disease begins in the retina and extends to the chorioid, as certain cases show no manifest affection of the chorioid.

Cataract may form, but after extraction of the lens a recurring film may occur in the pupil exactly like a wrinkled capsule requiring repeated needling. In one case the right eye was needled three times, and the left eye twice.

In rare cases one may find all these symptoms present without any pigmentation of the retina.

Other conditions noticed in connection with retinitis pigmentosa are deaf-mutism or deafness (usually progressive), mental deficiency in varying degrees has been noted and so have malformations, such as polydactylism. Peculiar is the appearance of the skin, which sometimes looks particularly gross, while in others it may be described as very smooth and delicate with a kind of smoky, lustreless appearance.

Heredity plays a very important part and consanguineous marriage has frequently been noted.

The pathology consists of thickening of the retina, and while there is atrophy of the retinal tissue, there is also a new development of fibrous tissue. The writer believes the condition to be not a simple atrophy, but due to exudative infiltration of the retina, filling up the physiological cup and producing the excessive fibrous tissue found in the degenerated retina. The elimination of this material chokes the lymph channels of the disk and those accompanying the venæ vorticosæ. producing on the one hand narrowed vessels by the process of choking, and on the other hand the blocking of the lymph space with subsequent pigmentation beginning in the region where the venæ vorticosæ perforate the sclerotic.

The diagnosis of the disease from conditions that are not truly of the same nature is chiefly limited to chorioiditis with subsequent affection and pigmentation of the retina, which is a more finite disease and does not progress after the condition has quieted down, and from syphilitic retinitis, which is often followed, after the acute symptoms have passed off, by pigmentation of the atrophic retina.

As to treatment, benefit may be derived from retinal feeding, and considerable improvement in sight results not infrequently from removal of the crystalline lens. Two cases are cited in which the lenses were removed, although there was merely a little degeneration of the posterior capsule, with a remarkable improvement in vision. W. R. P.

The Gross Anatomy of the Filtration Angle of the Human Eye.

Thomson, Arthur (*Ophthalmoscope*, September, 1910). The gross anatomy of the structures in the neighborhood of the filtration angle is described in detail, supplemented by photographic enlargements from thin microscopic preparations.

Attention is first drawn to the greater thickness of the cornea at its periphery than at its center. The measurements of the thickness ranged from .72 mm. to 1.4 mm., or an average of .95 mm. at the center: from 1.02 to 1.5 mm. at the periphery, an average of 1.19 mm.

It was observed from the microscopic sections that there was a well marked convexity of the internal surface of the cornea close to its periphery, and also that the sclero-corneal junction lies anterior to the angle of the iris. The blunt circumference of the cornea, club-shaped in section, is bedded in the scleral tissue in such a way as to produce a marked bulge on the inner surface of the cornea, immediately in front of its union with the sclera. Behind this, the outer wall of the angle of the iris is formed of scleral tissue, less dense than that of the cornea. The ciliary margin of the iris which in ordinary conditions of the pupil, or in dilatation, is much thinner than the rest of the iris, is attached to the tissue which constitutes the annular ligament .5 mm., or thereabouts, behind the inner margin of the sclero-corneal junction. In the interval between the sclero-corneal junction and the attachment of the iris, there is displayed, in section, a distinct recess, which is overhung in front by the rounded projecting rim of the circumference of the cornea. This resolves itself into a groove, which may be called, from its relation to the cornea, the sulcus circularis corneæ. Into this angular interval, formed by the bulging cornea in front and the outer wall of the angular recess, the thick, bevelled-like edge of the contracted part of the body of the iris is received. A sufficient space is left between the bevelled surface of the iris and the outer wall of the angular recess to provide for the free circulation of the aqueous humour, and to enable that fluid to reach the bottom of the recess—the position of the filtration angle.

A view is shown in which the much-thickened iris of a dilated pupil is withdrawn into the groove, leaving, however, a remaining interval for the free circulation of the aqueous. From other views, particularly those in which the parts are dissected, the author concludes that the small openings, usually described as crypts of the iris, separated from each other by the fibres of the pectinate ligament, are morphologically the same as the spaces of Fontana. These crypts, or spaces, are seen to lie in relation to the anterior surface of the thin attached ciliary portion of the iris, and their openings correspond to the deepest portion of the filtration angle.

The nature of the filtration angle varies with the altered condition of the pupil, and there are grounds for suspecting that an extreme dilatation of the pupil would tend to narrow, if not entirely close, the aperture, but alterations of the form and position of the lens may also exercise some controlling influence. It appears possible that the contraction of the iris under normal conditions, may contribute, as it were, by a kind of pumping action, to the interchange of the fluid contents of the anterior chamber with those of the system of Schlemm.

The photographs of the dissected preparations show a distinct groove, in correspondence with the inner surface of the sclero-corneal junction, produced by the overhanging of the projecting inner edge of the cornea at its circumference.

W. R. P.

Refraction of the Eye in School Children.

DORRELL, E. ARTHUR (*Brit. Med. Jour.*, August 13, 1910, p. 365). This article is a very clear summation of well-known clinical conditions, with the author's views as to their proper treatment, in children from five to fifteen years of age. There are few generalizations and principally detailed statements, along conventional lines, which can hardly be covered in abstract form.

E. S. T.

Injuries to the Eye.

PERCIVAL, ARCHIBALD STANLEY (*Brit. Med. Jour.*, October 22, 1910, p. 1208). The author takes up the practical considerations in the treatment of eye injuries, with reference, mainly, to foreign body injuries, and mentions briefly the principles to be observed in dealing with sympathetic ophthalmia. He calls attention to the fact that, "owing to the work of Leber," two kinds of hypopyon are to be distinguished. In one there is no perforation of Descemet's membrane, and the pus is sterile, while in the other there is a perforation of the membrane and the pus is "certainly septic."

E. S. T.

On the Treatment of Some Corneal Ulcers by Zinc Ions.

JONES, H. LEWIS (*Brit. Med. Jour.*, August 27, 1910, p. 520). The author reports four cases of Mooren's ulcer of the cornea treated by this method with marked success. All four cases recovered in a much shorter time than would have been expected in this intractable affection. The technique is as follows: A loop of zinc wire or the end of a zinc rod is armed with a fine web of absorbent wool, and dipped in a solution of zinc sulphate at 1%. This forms the positive electrode and is fixed in a suitable handle attached to the source of current. The negative electrode is the usual moistened plate or disk, applied to any convenient skin surface of the patient The eye is cocainized and the positive electrode is then held lightly against the ulcer so as to "bathe its whole surface with the zinc solution." An assistant then turns on the current very gradually up to 1 or 1½ milliamperes, according to the size of the ulcer and toleration of the patient. It must be turned off very gradually at the close of the application. The current is applied for 3 or 4 minutes. The eye should be treated for a day or two by instillation of zinc sulphate, 1% solution, after the ionization is over. A single good application should cause healing within a week.

The author suggests that the efficiency of the method is due to the penetration of the drug and the destruction of the bacteria, which are too deeply situated to be reached by local applications alone. E. S. T.

Recurrent Tuberculous Chorioiditis.

Koller, Carl (*Ophthalmoscope*, September, 1910). The author purposes to show that the tubercle of the chorioid is not only more common than we had thought, but that it occurs with a definite clinical picture and should be classified as one of the ophthalmoscopically recognizable forms of chorioiditis.

Up to the present two forms of tubercle of the chorioid have been described. To this is now added a third class, with the following clinical picture: A young adult, from 20 to 34 years of age, seeks advice because of a slight disturbance of vision, usually seeing a dark spot in some direction before his eye. Examination discloses now, or a few days later, precipitates on Descemet's membrane, occasionally opacities of the vitreous, and a distinct swelling of the papilla, especially in one quadrant, as if a woolly mass partially covered it. In the chorioid a few disk diameters from the nerve, at a spot not very far from the macula, a focus is seen, the appearance of which varies greatly, not only according to the stage when first seen, but also most probably according to the direction of its growth (whether toward the retina or toward the sclera). In a fresh case the focus most frequently has the appearance of an indistinct pearl-pink exudate, or a roundish bulging heap of asbestos-like "fuzz," varying from ¼ to disk size.

The changes taking place in these foci in the course of involution begin with a flattening of the focus, and the development of a well defined yellow border-zone, faintly stippled with pigment. This pigment border becomes more and more prominent, the center denser white and sparsely peppered with pigment. At the end of two or three months the whole focus, which is larger than the first, may be considered quiescent, although it is usual for the pigment border to become still heavier as time goes on.

Three cases are cited, all occurring in young, healthy adults, in whom no other tuberculous lesions could be traced. They show in common, recurrence, the development of precipitates and vitreous opacities early, an intense papillitis, a comparatively central location of foci, of circular or oval shape, and an increased size and pigmentation of the old quiescent patches.

Although positive proof of their tuberculous nature is not possible, the following points are taken as corroborative evidence: First, the great prevalence of the tuberculous compared to other pathologic processes, especially in early life. Second, the recognition of gray miliary tubercles, as such, ophthalmoscopically in some fresh cases, and the identity of the picture in others with that seen in acute miliary tuberculosis or tuberculous meningitis. In the obsolete cases, their distribution in the fundus of one eye, not widely disseminated, but occurring singly or as a confluence group in different stages, and their more or less central location, are details characteristic of tuberculous rather than luetic lesions, with which they have, until now, been commonly classed. Third, Sydney Stephenson proved the tuberculous nature of the lesion in one case by finding tubercle bacilli in the aqueous. Fourth, a positive local reaction in the affected organ after a diagnostic tuberculine injection in one of my cases; and, Fifth, the tendency, not only to recurrence, but to recurrence in the neighborhood of old cicatrized foci, which is a characteristic of the chronic tuberculous process everywhere. All of these factors justify us in classifying as tuberculous this far from rare form of recurring chorioiditis, easily recognizable with the ophthalmoscope." W. R. P.

The Results of a Short Series of Subconjunctival Injections in the Rabbit.

McIlroy, Janie Hamilton (*Ophthalmoscope*, September, 1910). A series of nine experiments with subconjunctival injection in the rabbit was carried out at the suggestion of Dr. A. Maitland Ramsay, who published a report of 50 cases of detached retina treated by the injection method. The solution he employed was a 1 in 2,000 bicyanide with 8%

sodium chloride. Marked improvement was made in ten cases, while in the remainder no evil effects followed.

In each of the experiments a solution was injected between the conjunctiva of the rabbit's eye under ether anesthesia. The rabbit was killed twenty-four to forty-eight hours later and pathologic preparations made. The solutions used were sodium-dionin-bicyanide solution, ten to twenty drops, of 8% sodium chloride solution ten to fifteen drops.

The results showed that in the rabbit the tissues of the eyeball, beyond a transient local irritation, are singularly free from disturbance from subconjunctival injection.

Some points deserve special notice in the results obtained. The operation gives little or no inconvenience, once the effects of the general anesthetic have passed off, notwithstanding the fact that the "blister" is not always absorbed within the first forty-eight hours. In all cases a local irritation follows the injection, the infiltration being usually confined to the intrinsic tissues of the eyeball. The most noteworthy point is the dilatation of the vessels of the iris, a feature which occurs in the early stages of almost every case. The chorioid is unaffected in the earlier stages, and the affection, when it does occur (as in one experiment, eight days after operation), is so slight as to be of doubtful significance. The sclerotic is usually free from any infiltration. The other point which is of value is the distinct increase of albumen which was found in the aqueous fluid in one experiment. The absence of this feature in the other cases where a test was made is of less significance. It is to be regretted that the aqueous was not tested in every case, as one might have obtained still further positive evidence of the presence of albumen. It has been advanced as an explanation of the value of subconjunctival injections that, owing to the increased albuminosity of the fluid in the aqueous chamber, there is mechanical blocking of the filtration spaces, so that the presence of additional albumen is of considerable importance. W. R. P.

Five Months' Ophthalmic Work at Luxor in 1910.

MacCallan, A. F. (*Ophthalmoscope*, September, 1910). An abstract is given of a paper read July 28, 1910, at the meeting of the British Medical Association, reporting the ophthalmic work being done at Luxor, Egypt.

Ophthalmic organization in Egypt consists of five hospitals, two large, traveling, tent hospitals and three permanent hospitals. Of interest is the fact that a system of ophthalmic inspection of some of the preparatory and primary government schools has been established, dealing with more than 4,000 pupils. Trachoma is found in about 96 to 97% of these pupils. The data given is from the traveling hospital which was located for five months at Luxor, during the winter of 1909-1910. The number of cases examined daily averaged 300. Blindness in one or both eyes amounted to 13.5%. The statistics of blindness among over 100,000 hospital patients seen in four years in Egypt show 8.9% of blindness in one or both eyes.

There were seen at Luxor 299 cases of primary glaucoma, in only six of which was the vision sufficiently good to warrant the performance of iridectomy. Acute glaucoma in its initial stages is rarely seen in Egypt, since at the onset the patient, according to the usual custom, wraps his head up in a shawl and stays at home until he is blind, after which he is generally persuaded to seek surgical advice if it is available.

There were 547 cases of ingrowing eyelashes, of which 385 were operated. In all 1,855 operations were performed during the five months; of these 1,182 were minor operations.

The scheme of ophthalmic relief in Egypt means the provision of a permanent hospital in the capital town of each province and of a complete traveling hospital to tour the districts of each province. There should be, in addition, at least two flying columns consisting of two or three tents in charge of a single surgeon traveling in the more remote parts of each province.

Each of these elements would have a well defined function. The flying column would treat only trachoma and conjunctival affections and their sequelæ and should preach a propaganda of ophthalmic hygiene in the villages. More serious cases, requiring admission as in-patients, would be drafted to the complete traveling hospital or to the permanent hospital.

The permanent hospital of the province would act as a base for all the traveling hospitals of each province and as a center of clinical instruction for post-graduate students.

W. R. P.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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PHILADELPHIA.

Albert C. Sautter, M. D.,

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PHILADELPHIA.

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ST. LOUIS.

The Reflex Character of Adaptation Processes, in Particular Dark Adaptation, and Their Relation to Topical Diagnosis and Hemeralopia.

Behr, C., Kiel (*Archiv. fuer Ophthal.*, Vol. 75, Part 2), concludes, as the result of extended investigations, that the expiration of the increase of sensibility of the rod structures of an eye during exposure to the dark is greatly influenced (in the normal) by simultaneous, continuous illuming of the other eye. The sudden, abrupt rise of sensibility following the first several minutes in the dark is then entirely absent, the increase being slow and comparatively uniform. The end value of sensibility obtained after three-quarter hour exposure to the dark under these conditions is about one-half less than the monocular estimated value after binocular dark adaptation.

A decided difference exists between the curve value of the peripheral nasal retinal portions (for which no corresponding points exist in the homonymous temporal portions of the other illumed eye) and the curve value of the remaining retinal regions which possess corresponding points in identical positions in the other eye.

A reduction of sensibility of the rod structure is present only in those portions which by corresponding points are related to the other illumined eye, being absent in the nasal retinal periphery where this relation is wanting and where the increase of sensibility is entirely normal.

In optic atrophy, in spite of normal visual acuity and normal color field, the rod function may be seriously impaired.

In chiasm affections, too, the rod function in the unaffected portions of the visual field may be much impaired in spite of normal form and color field.

From the material at hand, the supposition is probably correct, that this reduction in both instances results particularly from inflammatory or inflammatory-degenerative processes, while those acting deleteriously by simple compression are more apt to affect visual acuity and color sense (cones) than dark adaptation (rods).

In incomplete, relative tract hemianopsias the function of the rods may be more or less seriously impaired in portions of the visual field of the diseased halves in which cone function has been partly restored.

In incomplete, relative hemianopsias of cerebral origin, however, there is no impairment of dark adaptation, in spite of disturbances of color sense.

The investigation of dark adaptation, therefore, makes it possible in many cases to determine a lesion of the basal optic tracts before such are demonstrable by the other usual methods of examination.

On the other hand, in incomplete and relative homonymous hemianopsias the discovery of impairment of dark adaptation in the relative functionally capable regions of the relative lost halves of the visual field, points to a lesion in the tract or lateral geniculate body instead of to a cerebral affection and vice versa.

The results of clinical and physiologic investigations lead to the conclusion that the rod function or the regeneration of the visual purple is traceable to a center situated probably between the optic tract and the intracerebral tracts. The supposition seems plausible that the centripetal tracts of the rods of two homonymous halves of the retina radiate into such a center in an anatomic relationship similar to that of the cone fibres, from which center centrifugal tracts return to the rods or pigment epithelium regulating the secretion of the visual purple.

An important advantage pertaining to the functional examination of the rods over that of the cones consists in the greater accuracy with which sensibility and function can be determined and compared, than is possible in testing the most sensitive function of the peripheral cone structures—the color sense.

In spite of marked impairment of dark adaptation, v. z., the rod function, the slightest hemeralopic disturbances may be absent; moreover, pronounced hemeralopic disturbances may exist without the slightest disturbances of the rod function being manifest. It seems, therefore, that hemeralopia is not directly due to disease of the rod elements, but the result of impairment of the cone function, an inference requiring further study.

The elements of the rod apparatus are without notable pupillomotor valence.

The cases of tract hemianopsia cited all exhibited *pronounced* anisocoria and lid fissure difference, the wider pupil and fissure being on the same side as the hemianopsia. In cerebral hemianopsia this symptom is absent.

The author's previously expressed view concerning the topical diagnostic value of this symptom thus receives still further support. A. C. S.

On the Dark Adaptation of the Retina.

Best, Dresden (*Archiv. f. Ophthal.,* Vol. LXXVI, Part 1), is of the opinion that retinal sensibility after previous light adaptation rises in the dark quickly and uniformly until the 12th minute, from which time until the 18th minute the rise is less rapid and increasingly less marked, the adaptation curve terminating in a flat arch; or, to be more precise, until the 12th minute sensibility is doubled about every 2 minutes, after which 3 minutes are required, and after half an hour 8-15 minutes, if such an increase happens to follow, which depends upon individual peculiarities.

In serious derangements of adaptation (pigmentary degeneration) the regulating processes require much more time to adapt themselves, without, however, being deprived of the uniform increase distinctive of normal adaptation; they no longer reach the proper adaptation level with weak illuminants, and in unfavorable cases become entirely extinct. In dark adaptation either special visual substance or special retinal elements, or both, must probably be active.

The author's sensibility curve, a modification of Aubert's and Piper's curves, while not explaining any better the retinal process, disproves the following oft-quoted hypothesis, that during the first 10 minutes a slow increase occurs, principally dependent upon the function of the light mechanism, whereas the ensuing decided increase is significant of the action of the rod elements. This sudden rise at the expiration of 10 minutes is found neither in the curve of the uniformly decreasing curve values, nor in the author's modified curves. The pathological curves in hemeralopia, too, are not suggestive of two different retinal processes.

This uniform rise of sensibility indicates that in the examination of pericentral and peripheral retinal regions we have no means to differentiate rod from cone adaptation.

A. C. S.

Experimental Investigations Regarding the Liability of Ocular Infection in Diabetes and the Bactericidal Action of Diabetic Blood Serum Upon the Pus Organisms.

HAYASHI, M., Tokio, Breslau University Eye Clinic (*Archiv. f. Ophthal.,* Vol. LXXVI, p. 1). The investigations of Smith and Grossman have shown that a certain, constant, moderately low percentage of sugar (.3—.5%) in the tissues, favors the implantation and growth of pus cocci and increases their virulency. These results have been verified by Hayashi in rabbits rendered diabetic by amyl nitrate or adrenalin injections, and in dogs by pancreas extirpation. He also finds the bactericidal properties of the blood serum in adrenalin diabetes of the rabbit and in pancreas diabetes of the dog considerably weaker than the normal serum. In natural diabetes, the products of abnormal metabolism (acetone, oxybutyric acid, etc.), act injuriously upon the tissues, rendering them more liable to infection.

While the author's findings seem to emphasize the importance of decreasing the sugar contents of the urine before eye operations, the favorable results usually obtained in these cases, including Withoff's statistics in one hundred and fifteen operations for diabetic cataract, teach that complete desaccharization is not only unnecessary but inadvisable. A too rigorous antidiabetic diet is frequently inadvisable, because in many cases the general condition seriously suffers thereby, overbalancing the advantages derived from diminishing the chances of infection. Eye operations, particularly cataract extractions in the diabetic, should be performed under rigid aseptic precautions. R. C. S.

Experimental Investigations Concerning the Regeneration of the Corneal Epithelium Under Normal Conditions and When Subjected to Therapeutic Agents.

JUSELIUS, E., Niborg, Finnland (*Arch. f. Ophth.,* Vol. LXXV, p. 2), summarizes his results as follows: In studying the regeneration of the corneal epithelium and the therapeutic agents influencing the same, trephine defects are the most suitable, showing normal regeneration to proceed as follows:

1. Immediately after the removal of a portion of the central corneal epithelium, a preliminary mitotic division takes place centripetally at the corneoscleral border, reaching the defect in 2 hours ("Karyokinetic reaction wave"). 8 to 12 hours later karyokinesis does not occur at the corneal periphery.

2. The actual regeneration of the defect by the marginal cells does not begin until 4 hours after the traumatism. The average rapidity of the primary healing-over process in rabbits is 1 mm. in 12 hours.

3. A passive gliding, a propulsion of the original epithelium from the margin into the defect does not occur.

4. *Cocaine hydrochloride,* even in dilute solutions, acts inhibitively upon regeneration. The reaction wave is absent, and the vitality of the cells lowered. More concentrated solutions (over 4%) do considerable harm.

5. *Subconjunctival injections of physiologic salt solution*

somewhat expedite regeneration, especially 2% solutions, whereas 4% and particularly 6% solutions act inhibitively or are directly injurious.

6. Subconjunctival injections of *sublimate,* 1-10000, acts almost like 2% salt solution, but more irregularly. Subconjunctival injections of 1-2000 sublimate act injuriously.

7. Instillations of 10% *dionin* are slightly stimulating, more so in rabbits than in dogs.

8. Moist *heat* stimulates epithelial regeneration, while *cold* (ice compresses) acts inhibitively. A. C. S.

Concerning the Lymph Streams of the Eye.

HAMBURGER, Berlin (*Klin. Monatsbl. f. Augenheilk.,* July, 1910), summarizes his experimental findings as follows (in abstract): Leber's theory that the physiologic aqueous humor flows from the ciliary body through the pupil into the anterior chamber in a measurable visible current continuously or at short intervals is not susceptible of proof. If it were true such streams would be visible microscopically by the use of fluorescin or indigo-carmine, both of which substances easily penetrate the ciliary body but this is not the case. Both stains, however, show lymph streams only on the anterior surface of the iris. Such lymph currents are apparently normally immeasurably slow. The assumption of Leber and his pupils of the transmissibility of the pupil cannot be demonstrated. The same experimenter's estimation of the quantitative secretion of the aqueous is entirely too high, as their calculations include only the outflow through Schlemm's canal and ignore the resorptive power of the iris. The principal channel of efflux is not Schlemm's canal, but the entire vascular surface of the iris. The therapeutic value of eserine is due to its effect in flattening out the iris and increasing its resorptive surface. The diminution of its surface explains the increase of intraocular tension induced by atropin. The cornea shares also in the resorption of the aqueous. The outflow from the eye is not, as has heretofore been assumed, a physical process of mathematical constancy, but a simple, slow resorptive process. The physiologic aqueous is very likely of entirely different origin than the regenerated aqueous and has nothing to do with the activity of the ciliary body, as when the latter secretes, be it ever so little and slow, it produces a secretion which abounds in albumin and fibrin, consequently totally different from physiologic aqueous. Regenerated aqueous comes almost entirely from the ciliary body, but this activity is followed by either a complete cessation or by the secretion of an amount which by present methods is immeasurable. The energy of the ciliary body is, therefore, normally purely potential.

The above conditions apply principally to rabbits' eyes; for human eyes the conditions differ slightly and might be expressed as follows: As fluorescin is highly diffusible, corresponding to most of the constituents of the aqueous, its failure to overflow into the anterior chamber is due to a surprisingly slow metabolism. As the human ciliary body is impenetrable to fluorescin, even after puncture (in marked contrast to the findings in animal experimentation), this substance is not suited for determining the secretory functions of this body. A legitimate dependence between the secretion of albumin and fluorescin cannot well be assumed because the ciliary body, notwithstanding its increased albuminous content after puncture is impassable for the stain, and because the kidneys, whose secretion is free from albumin, secretes it without trouble and not by diffusion but by true secretion. The regeneration of the aqueous is, in man, largely through the ciliary body. The iris also takes part, but only with a portion of its circumference. In inflamed eyes (iritis and cyclitis, but not in conjunctivitis), even after the instillation of dionin the stain enters the anterior chamber so that in about 30 minutes it is of a light green. The source of this stain is the iris. In human eyes also it is very probable that there exists a vent-like physiologic pupillary exclusion; how often or seldom this is physiologically raised is unknown. W. Z.

The Limits of Visual Acuity.

THORNER, Berlin (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910), finds that a true judgment as to the power of differentiation between two retinal images can best be obtained by the use of parallel bright lines upon a dark background whose width is very narrow compared to the distance between them. Visual acuity is, aside from all other considerations, most dependent upon the diameter of the pupil. Experiments show that for the recognition of two points that it is necessary to have for—

1″ (normal v) a pupillary diameter of over 1.6 mm.
30″ (twice normal v) a pupillary diameter of over 3.2 mm.
20″ (thrice normal v) a pupillary diameter of over 4.8 mm.
15″ (4 fold normal v) a pupillary diameter of over 6.4 mm.
12″ (5 fold normal v) a pupillary diameter of over 8.0 mm.
greater visual acuity in man than this is impossible.

W. Z.

Observations Concerning Ophthalmotonometrie.

LANGENHAN, F., Berlin (*Zeitschrift f. Augenheilkunde,* March, 1910, Band XXIII, Haft 3), believes that the Schiötz tonometer is best adapted for the accurate determination of intraocular tension. It is preferable to make 3 to 4 readings, taking the average measurement as the correct one.

Measurements of 60 normal eyes showed pressure varying from 18 to 27.5 mm. Hg., the most common pressure being recorded at 21 mm. Hg.

In normal eye, the intraocular pressure is not appreciably altered by instillation of holocain (2%) or atropine (1%). Cocain in 10% solution causes a slight decrease in pressure, pilocarpine (2%) and eserin (1%) producing a decrease of from 4 to 5 mm. Hg.

Tenotomy and advancement of the recti muscles are followed by a slight decrease in intraocular pressure. High myopia has no apparent connection with intraocular pressure.

Diseases of the cornea and sclera and particularly sclerokeratitis can give rise to marked hypotonia.

The variation of pressure in iritis and iridocyclitis show no regularity in the various stages. Pathologically produced decreased intraocular pressure is rapidly but very transiently increased by subconjunctival salt injections.

There is a tendency to increased pressure in the eyes of patients suffering from Basedow's disease.

Intraocular tumors in the early stages are often accompanied by decreased intraocular pressure, thus making the differential diagnosis between tumor and detached retina not dependent upon the intraocular pressure.

The reduction in tension in glaucomatous eyes by means of instillations of pilocarpin and eserin is various in different individuals. Pilocarpin is usually weaker but more constant in action.

The maximum decrease in tension is produced by both pilocarpin and eserin in three-quarters to one hour after the beginning of the instillation.

In glaucomatous eyes with no high tension there is a primary increase in tension as in normal eyes after the use of eserin.

The reduction in tension is very considerable after the continued use of eserin in an apparently normal eye, which is, however, predisposed to glaucoma. In fact, the cessation of eserin in such cases can cause the primary attack of acute glaucoma.

The best results are obtained therapeutically by the use of solutions of eserin of less than one-half of one per cent. In acute cases, when a strong solution of eserin is required, it is suggested that a previous hypodermic of morphine be given to the patient.

The use of cocain in association with eserin as lauded by Wicherkiewics should be condemned, as more harm than good is likely to ensue. The dilatation of the pupil by cocain overcomes the miotic action of strong eserin solutions, and in some cases the author has remarked an increase in the tension after use of the combined cocain and eserin solution.

The decreased tension present in cases of cataract extractions two weeks after operation, is gradually brought to normal with the complete closure of the wound, which in uncomplicated cases occurs a few weeks later.

A Scale for the Ophthalmometer Embodying the Recommendations of the Congress.

PFLUGER, Bern (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910), has devised a transparent disk, to be attached to the tube of the ophthalmometer, so graduated that it corresponds to the notation of the meridians as recommended by the International Society. It can be used only on the later models of the author's ophthalmometer.

W. Z.

Rare Congenital Anomalies of the Fundus.

Botteri, Innsbruck (*Klin. Monatsbl. f. Augenheilk.*, July, 1910). The first case consisted of monocular coloboma of the chorioid in L. E. directed nasalwards in the middle of which coursed the remains of Cloquet's canal. The median yellow-red hyperopic portion of the coloboma looked much like retained embryonal connective tissue. In the vicinity of the papilla at the edge of the coloboma were collections of pigment. In the vicinity of the incomplete atypical papilla there was an area in which the sclera was laid bare. The eye was converged. The patient was suffering from a retrobulbar neuritis.

The second anomaly was seen in an otherwise well developed woman. The R. E. was amblyopic. Extending from an atypical formed papilla and reaching almost to the lens was the remains of Cloquet's canal. In the periphery there was a quantity of small and large isolated collections of retinal pigment. and in the vicinity of the papilla there were isolated subretinal whitish dots surrounded by pigment. One of these, about one-half the diameter of the papilla, lying temporalwards from the papilla and partially surrounded by pigment, must be viewed as a rudimentary extrapapillary coloboma of the chorioid.

Two instances of striking examples of epipapillary membranes are described and pictured. W. Z.

Mixed Tumors of the Tearglands.

Mendez, Montevideo (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910). The patient was a woman 77 years of age. The growth had made its appearance five years before. It was of the size of a walnut and occupied the position of the lacrimal gland. In its removal it was found to be without adhesions and to contain a brownish pasty substance. Microscopically it was surrounded by a fibrous capsule giving off septa and containing quantities of elastic fibres. The principal tissues were of a myxomatous and of a sarcomatous nature. The sarcomatous tissue consisted of all forms of sarcoma cells, mostly, however, of small round cells. The myxomatous tissue was less in amount and was so poorly differentiated from the sarcomatous tissue that in some places it was intermingled with it, giving the appearance of a myxosarcoma. There were also islands of fibromatous tissue. Scattered throughout the sarcomatous and the myxomatous tissue were hyalin masses. Possibly due to hyalin degeneration of fibrous tissue. Glandular structure, either isolated or grouped, composed of the various structures characteristic of the tear glands, were present. Scattered throughout the growth were numerous cysts, the walls of which were lined with epithelium of various types. Masses of epiderm were present, either covering the cysts or occurring independently. Elastic fibres were found in all parts of the growth, occurring in islands of fine reticulum or in concentric layers about the cysts and glands. Glycogen was found in considerable amounts in the form of flakes or spheres. Blood vessels were everywhere present. W. Z.

Orbital Cyst Originating in Displaced Mucous Membrane.

Mendez, Montevideo (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910), points out the extreme rarity of this condition. His own patient was a man 56 years of age, who stated that for twenty-five years he had noticed over the inner angle of the right eye a tumor which had been very slow in its growth. On one occasion it had been aspirated. There was a spherical protrusion of the skin in the inner-upper region of the orbit, but not extending beyond its plane. It could be traced some distance into the orbital cavity. It was of elastic consistence, and presented no phenomena beside those of a simple cyst. At its removal it was found not to be attached to the bone and to have no communication with the accessory sinuses, and to contain a yellowish mucous fluid. Histologically the cyst had a diverticulum connected with central cavity. The wall was composed of connective tissue delicate and loose in the inner layers and less so the greater the distance from the central cavity. A large number of leucocytes were scattered over the surface, and in one place there was an area of round cell infiltration. Elastic fibres and blood vessels were present. The walls were lined by epithelium of varying form and thickness. At one point it resembled nasal mucous membrane. It was composed of cylindrical cells with peripheral nuclei resting upon one or more layers of round or oval cells containing round or oval nuclei, between which were leucocytes. In one place there were round cells either with or without polygonal cells. In other places it was so flat as to resemble endothelium. In places the lining membrane was degenerated or even destroyed. The lumen of the cyst contained blood and a few leucocytes. In the surrounding orbital tissue there was a mass of hyalin cartilage surrounded by cellular connective tissue. This could have been the trochlea or an orbital cartilage, such as has been described by Axenfeld and others. Several theories have been advanced to explain the origin of such cysts, the most plausible being that of Panas' modification of Hoyer's, that it is due to the inclusion of the upper part of the tear sac into the lacrimal groove. If this consists of skin a dermoid is formed; if of mucous membrane, a mucous cyst. W. Z.

The Histogenesis of So-Called Chloroma.

Suganuma, Kyoto (*Klin. Monatsbl. f. Augenheilk.,* May and June, 1910). The case occurred in a boy twelve years of age. Five months before coming under observation general pallor was noticed and two months later deafness, with tinnitus, and one month later severe headache, fever, bilateral exophthalmos with swelling in the temporal region. There was tenderness over the bones in different parts of the body. When first observed tumors about two fingers breadth could be palpated between the ball and the roof of the orbit, to the margin of which it was firmly attached. The overlying skin was freely movable and the veins dilated. On the right side there was lagophthalmos, the cornea was destroyed and there was marked chemosis. The movements of both globes was restricted. In both temporal fossæ there were elastic swellings of the size of a pigeon's egg and immobile. Three weeks later the patient died. The blood examination eight days before death showed marked hydremia, hemoglobin 23%, erythrocytes 640,000, leucocytes 16,000, W to R as 1 to 40, eosinophiles, polymorphonuclear leucocytes very few, neither mononuclear leucocytes, eosinophiles nor mast cells. The myelocytes were numerous and two to four times the size of red corpuscles and had large, bright, sometimes round, sometimes oval, nuclei, with a few bladder-like nuclear bodies.

A study of the case permits the author to arrive at the following conclusions:

1. So-called chloroma is a secondary phenomenon of disease of the lymphatic and blood making apparatus.

2. Two forms are to be distinguished—a lymphoid and a myeloid. Myeloid chloroma is always myelogenous, but the lymphoid is not always lymphogenous, but can be also myelogenous. The case reported belongs to the myeloid form, but is also myelogenous.

3. The etiology of the disease is unknown. Tuberculosis of the lymph glands appears to stand in no causal relation to the disease.

4. The green coloration of the new growths is caused by the presence of intercellular pigment granules which give all the reactions for fat. W. Z.

Dermoid of the Cornea with Elastic Cartilage.

Napp, O., Berlin (*Zeitschrift f. Augenheilkunde*, March, 1910, Band XXIII, Heft 3). The author examined a case of dermoid of the cornea in which he found no hair, bone, etc., and in contrast to the usual findings, observed only elastic cartilage, instead of the hyaline variety. F. K.

The Substitution of the Operative Correction of High-grade Myopia by a Combination of Lenses (Telescopic Spectacles).

Hertel, E. (*Archiv. fuer Ophthal.*, Vol. 75, Part 3). Such spectacle glasses, consisting each of a convex objective and a concave ocular, have been manufactured by C. Zeiss of Jena (at Hertel's suggestion) for cases of high myopia. In appearance they resemble automobile goggles. The weight of a double telescopic adjustment is 36 grams, which, however, causes little discomfort as the bridge is made very broad. A single combination costs about 15 marks.

Though decreasing the field of vision these glasses produce larger images and make distant objects more distinct than with the usually prescribed concave lenses. The degree of enlargement may be varied, generally only low degrees being accepted. The larger the image the narrower the field of vision.

Most of the patients who were fitted with these spectacles considered them a decided improvement over their concave correcting lenses.

For near work an additional condensing lens is necessary in very high myopia and in elderly patients (presbyopic telescopic glasses).

Hertel favors the substitution of this Zeiss system of enlarging images for the operative treatment of myopia, especially since by this method new ideas regarding the progression of myopia, the prevention of complications, etc., will perhaps suggest themselves. A. C. S.

NOTE.—"The Theory of the Telescopic Glass" is discussed by v. Rohr in the same number. The article does not lend itself to abstraction. A. C. S.

Myopes in Illiterates and Astigmatism and Corneal Opacities in Egyptians.

MEYERHOF (*Cent. f. Prakt. Augenheilk.*, July, 1910) has collected some interesting data on myopes among the illiterate Egyptians. According to the census of 1907 only one person in eighteen could read or write. Also, in spite of the fact that most vocations require little close work, the proportion of high myopes is tremendous. Even in the preparatory schools, among children from 8 to 14 years, he reports, in one school of 455 boys, only 21 with healthy eyes, 78 with acute, 376 with chronic trachoma, and 10 with scars from trachoma, 110 had corneal scars, 152 were hypermetropes, and 128 myopes.

Meyerhof made 5,445 examinations during the past two years, from which he selected those cases of adult Egyptians where the refraction and visual acuity could be recorded. There were only 915 cases; 1,500 children, 1,000 Europeans and Asiatics, and as many acute cases, adherent leucoma, glaucoma, etc., being excluded. Of these 915 patients, 894 had trachoma in the various stages, 685 (78.4 per cent) corneal opacities in both eyes, 230 (25.2 per cent) had clear corneæ in one or both eyes. There were 211 emmetropes, 210 hypermetropes, and 494 myopes. One hundred and sixty-seven cases (18.3 per cent) had regular astigmatism; 361 (39.4 per cent) had irregular astigmatism. Of the 387 cases classed as normal, nearly all of them showed slight irregularities with the keratometer. He attributes the large percentage of myopes to race predisposition; poor vision due to corneal scars and astigmatism; and lowered vitality, due to poor nutrition. M. W.

Concerning Myopia in the Egyptian Races.

Meyerhof, Cairo (*Klin. Monatsbl. f. Augenheilk.*, August, 1910), examined the eyes of 500 Egyptians relative to myopia because of the frequency of all grades of myopia and the disposition to the existence of the elongated eyeball in these races. He hoped, through anatomical topography, to explain such a predisposition. He found that neither in the form of the face nor in the orbit nor in the distance between the eyes was there any relation to the myopia. W. Z.

Spasm of Accommodation and Nystagmus in Miners.

Ohm, Bottrop (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910), records three cases of miner's nystagmus accompanied by spasm of accommodation. Two of the subjects were 17 and one 38 years of age. All had a low degree of hyperopic refraction. The spasm was of short duration and the amount of M. induced varied greatly, but seemed to be increased by convergence upwards. The author states that a spasm of convergence and of the sphincter pupilla frequently occurs in miner's nystagmus. W. Z.

A Noteworthy Phenomenon of Movement of the Eyes.

Lohmann, Munich (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910), has observed this phenomenon frequently, but never so pronounced as in the cases here reported. It consists of a movement of the sightless eye from its primary position of up and out when the sound eye is covered. In both instances the eyes were blind as the result of deep-seated inflammation, but they were not shrunken. A peculiar associated movement whereby there was a slight turning of cornea in the blind eye when the consensual pupil-reaction was tested, also occurred. The author believes the explanation of these phenomena is to be found in the fact that the branch of the third nerve which supplies the inferior oblique comes off from the motor root of the ciliary ganglion. The stimulus from the consensual pupillary reflex goes to the iris of the deviated eye; because of the terminal changes it can produce no iris movement; the stimulus is then transmitted to the peripheral nerve fibres of the inferior oblique. This phenomenon is similar to the synergy between the intraocular muscles and groups of muscles elsewhere which has been for a long time familiar. In both of the author's cases the traumatic inflammation had resulted in adhesions and atrophy of the iris. W. Z.

Suggestive (Imaginary, Autosuggestive) Amblyopia, Nervous Astenopia and Physiological Hyperopia in School Children.

Katz, St. Petersburg (*Klin. Monatsbl. f. Augenheilk.*, July, 1910), states that these three conditions have in common that they occur in nervous children, possess no visible changes in the visual apparatus or refractive media, and are all relieved by plane glasses. The following scheme he thinks of value for the school surgeon to bear in mind:

Asthenopia nervosa (neurasthenia).
Anesthesia retinae | Asthenopia retinalis
Amblyopia spuria (Simualata s. autosuggesta) | Asthenopia accommodativa fugax
Amblyopia hysterica.

In imaginary amblyopia there is deterioration of vision, both for distance and near, which is bettered by weak convex glasses and disappears complete when the convex glass is neutralized by concave glasses. In nervous asthenopia there is beside a characteristic frown caused by photophobia and a fatigue visual field. In fugacious accommodative asthenopia the presence of physiologic hyperopia can be determined by objective methods, the absence of amblyopia in testing vision without glasses, and the maintenance of full vision with weak convex glasses. W. Z.

Concerning the Regulation of the Position of the Eyes by the Auditory Apparatus.

Bartels, M., Strassburg (*Arch. f. Ophth.*, Vol. LXXVI, Part 1), ends his comprehensive treatise with the following deductions, based chiefly on animal experimentation:

The movements of the endolymph in the semi-circular canals causes a movement of the eyes in the same direction.

In the horizontal semi-circular canal, the movement directed towards the ampulla calls forth the strongest ocular movement; in the frontal canal that directed towards the canal (Ewald).

The phenomena resulting during rotation after section of the acoustic nerve may satisfactorily be explained by the theory of lymph motility.

The backward current of lymph is never able to entirely replace the forward current even a long time after section.

The engendering of nystagmus is not absolutely dependent upon the presence of semicircular canals. It is absent in organisms with developed semicircular canals (in some fishes, premature infants); it is present in ordinary otocysts (crabs).

The auditory apparatus constantly produces a strong tonus of the ocular musculature (labyrinth tonus), the tension directions produced by the two labyrinths being in opposite directions. Each labyrinth by the tonus exercised upon the ocular musculature draws both eyes toward the opposite side; furthermore, the eye on the same side is drawn upward, the other eye downward, the action on the adjacent eye being the more pronounced.

Which portions of the layrinth give rise to this tonus is not known. A. C. S.

A Case of Fungus Concretion in the Canaliculus.

HERRENSCHWAND, Innsbruck (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910). After extirpation of the sac in a patient 46 years of age, who had a milky-white discharge from the canaliculus following a burn, the discharge was found to continue. On slitting up the canaliculi the upper was found to be symmetrically distended, containing a large concretion, brownish-gray in color and of a crumbly consistence. In the lower canaliculus a small concretion and long mucopurulent strings were present. Externally, the upper punctum appeared dilated and prominent with the surrounding tissue thickened, and it was turned away from the globe. Numerous organisms, including the b. mesentericus ruber, were found. The concretion was formed of the streptothrix. W. Z.

Concerning a Rare Rhinological Cause of Epiphora.

Marx, H., Heidelberg (*Arch. f. Ophth.,* Vol. LXXIV, Festschrift), cites the histories of two cases in which epiphora was due to a dental cyst pushing up the floor of the nose. Incision of the cyst in one case; incision, partial extirpation and curettage in the other, resulted in a complete disappearance of the epiphora. That similar cases have not as yet been observed is probably due to the fact that only in the minority of cases of epiphora are careful rhinologic examinations made. The cases teach the importance of rhinologic examination in all obstinate cases of epiphora. A. C. S.

A Contribution to the Pathological Anatomy of Diplobacillary Conjunctivitis.

Miyashita, Tokio-Freiburg (*Klin. Monatsbl. f. Augenheilk.,* May and June, 1910). This study was made from an eye removed from a man 60 years of age. The clinical history was briefly as follows: An exacerbation of a very chronic neglected case of diplobacillary conjunctivitis, complicated at times with corneal ulcers. During the course of a hypopyon keratitis the patient died from erysipelas of the face, and a histologic study of the lids and ball were made. There was evidence that under the effect of the long continued maceration by the secretion, a gradual thickening of the lid margins and an ectropion of the lower lid had taken place. With this, the usual picture of diplobacillary catarrh, was an eczema of the face. That this led to a stubborn blepharoconjunctivitis and in the secretion to the presence also of staphylococci. The striking point in the case was the great papillary growth of the palpebral conjunctiva, especially of the tarsus. This arose from the marked cellular infiltration and hyperemia of the adenoid layer. The bulk of the infiltrate was composed of mast cells, as is the case in all chronic catarrhs of the mucous membranes. The designation of "conjunctivitis plasmacellularis" is not justified. This type of cell is found in various processes, e. g., trachoma and vernal catarrh. Beside hyalin granules there were modrate numbers of mast cells and a few eosinophiles. Leucocytes with lobulated nuclei were less numerous than in the case reported by Stock. In the author's case, as in the case of Stock and that of Pusey, the bulk of the infiltrate was plasma cells, so that it may be stated that in diplobacillary conjunctivitis, as in other chronic conjunctivitis, these cells plays an important role. Mucoid degeneration of the epithelium was also pronounced. He confirms Mayou's finding that in the secretion there were relatively few wandering cells and much epithelium. The bacterial examination of sections was negative, nor could he confirm Pusey's finding that the bacilli collect in the excretory ducts of Krauss' glands and that this tends towards recurrences, although he thinks this plausible. W. Z.

Dystrophia Epithelialis Corneae.

Fuchs, E., Vienna (*Archiv. fuer Ophthal.,* Vol. 76, Part 3), describes a degenerative form of corneal disease which he terms dystrophia epithelialis corneæ, his findings being based on the clinical histories of 13 cases, three of which were associated with increased tension. The central portion of the cornea from one of the latter was obtained for microscopic examination.

He concludes that dystrophia of the corneal epithelium is a degenerative affection occurring only in elderly subjects, particularly in females. Either one or both eyes may be affected. The disease begins with decrease of corneal tactile sensibility, followed by an opacity of the cornea accompanied either with slight or without any inflammatory symptoms; in the latter cases impairment of vision first attracting the patient's attention. The opacity is superficial and diffuse, densest in the pupillary portion, gradually thinning out towards the transparent margin. As a rule the opacity extends farthest below.

The epithelium is chiefly involved, the surface being dull or coarsely stipled, cloudy and somewhat swollen. Distinct blebs occur or with the loupe fine dark points are found representing hollow spaces within the epithelium. These appear black when viewed with the pupil as the background, showing their location to be principally in the epithelium. On removing the latter a very delicate, superficial, punctate opacity of the parenchyma is disclosed. The cornea finally loses tactile sensibility entirely and in the unilateral cases the apparently normal cornea of the fellow eye also exhibits marked impairment of sensibility.

The deeper portions of the eye are normal except in those complicated with increased tension. In the majority of cases, however, tension remains permanently normal.

In the course of time the opacity slowly but steadily increases in density. Eventually there results in the pupillary region a fairly well circumscribed, dense, gray opacity, somewhat above the level of the surrounding only slightly opaque peripheral portions. This opacity is caused by the deposition of new-formed connective tissue between Bowman's membrane and the epithelium. Vision then is reduced to counting fingers at close range.

The etiology is unknown and treatment has proved ineffectual.

The disease must be differentiated from keratitis interstitialis, profunda, disciformis, vesiculosa and a glaucomatous opacity.

In glaucoma the opacity is only exceptionally so dense (acute attack), and never endures for years; whereas in glaucamo vision is usually worse in the evening the reverse is true in this affection. Miotics or operations for the purpose of reducing tension have none or only a temporary effect upon the opacity. In dystrophia epithelialis corneae the opacity may be limited to one eye for years, while in glaucoma the condition usually in time affects both eyes.

A. C. S.

On Gonorrheal Corneal Ulcers.

Adam, C., Berlin (*Muenchen. med. Woch.*, July 19, 1910), believes Bayer's criticism partly the result of considering cases with clear corneæ together with those with central ulcers. Adam believes in most cases the latter are due to a thrombosis of the nutrient vessels. Treatment is without avail, the process eventually terminating in perforation. These corneal ulcers or diffuse corneal opacities (the first stage of necrosis) should be differentiated from maceration ulcers, which are usually at the limbus and respond to treatment.

In one case of adult blennorrhea with central corneal ulcer examined histologically he found in the conjunctiva and episcleral tissue extensive vessel thrombosis. Bayer's excellent results obtained in nine cases of adult blennorrhea with Ag. No. 3, he is inclined to question. These probably were not all cases of adult blennorrhea.

The ointment should be introduced in sufficient quantity.

The treatment recommended by Adam, based on the results obtained in 60 cases, is as follows (in abstract):

1. Two per cent silver nitrate may be carefully instilled in the early stages, provided inflammatory symptoms are not pronounced.

2. The actual treatment comprises instillations every one-half hour of 5-10 per cent sophol or 10-20 per cent protargol, followed by the introduction of the ointment (vide original).

3. When the secretion has diminished 5 per cent lenizet is employed, substituted later by euvaseline or zinc vaseline. silver nitrate ½-1 per cent may again be used when irritative symptoms have subsided.

4. The patient is discharged with zinc vaseline after several negative bacteriologic examinations have been obtained.

5. The occurrence of ulcers does not change the treatment. Marginal ulcers may require cauterization. A. C. S.

Ring Abscess of the Cornea.

Cramer, Kottbus (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910), saw the patient, a woman 22 years of age, twenty-four hours after having had removed a particle of dust from the R. E. Condition: upper lid immensely swollen, free pus from fissure, great swelling of the conjunctiva, periphery of the cornea converted into an abscess with beginning prolapse of the iris up and in. The center was still clear enough to see that there was an exudate in the anterior chamber and that the iris was normal. The next morning the whole cornea was infiltrated and its surface raised as a bleb. The conjunctival sac contained pneumococci and staphylococci. Enucleation was performed. Preparations from the corneal tissue showed no pneumococci and a few staphylococci. Inoculation test in rabbit's eyes showed in twenty-four hours, at the pupillary border just beneath the point of penetration of the cornea (with the remainder clear), a small focus of, apparently, pus. In the corneal lamella, close to Descemet's membrane, 1 mm. removed from the limbus, an irregularly distributed infiltrate covering one-half of the cornea, which had the naked eye appearance of a ring. A few days later, without subsequent change, this disappeared. In the other eye, in which a portion of tissue had been introduced into the vitreous, a temporary clouding of this structure occurred.

In discussion Wagemann took exception to the classification of the case as one of "ring abscess," as in Fuch's cases the origin was always endogenous. The author says that in that case we must hereafter recognize both forms of infection.
W. Z.

Concerning Keratitis Parenchymatosa Centralis Annularis.

Vossius, Giessen (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910), writes in reply to Gilbert's assertion (see Annals for July, 1910), that this is only a transient stage of parenchymatous keratitis which in no way is to be differentiated from diffuse parenchymatous keratitis, that his own view that this form on account of its typical clinical picture is deserving of a special place in parenchymatous keratitis, could receive no stronger support than the author's own description of the cases seen by him. W. Z.

A Contribution to the Pathological Anatomy of Keratoconus.

Erdmann, P., Rostock (*Archiv. fuer Ophthal.*, Vol. 75, Part 1), reports a case of bilateral keratoconus with congenital ocular abnormalities (microcornea, cataract). In one eye there was an incomplete, narrow ring of a rust brown color in the superficial layers of the corneal parenchyma. Fleischer has attributed this discoloration in keratoconus to a deposition of hemosiderin resulting from hemorrhage from new formed vessels. In the author's case, however, no such vessels were seen.

The patient accidentally struck his other eye, a perforating corneal wound ensuing at the limbus. This eye had to be enucleated, pathologic examination of which disclosed a general thinning of the cornea, more marked in the central portions. There were both large and small defects of Bowman's membrane filled in with a loose fibrillary or a coarse cicatricial-like tissue. In some places the basal epithelium had proliferated, forming peg-like processes extending parallel to

Bowman's membrane into the loose fibrillary tissue. Similar changes have been observed in hydrophthalmos. Descemet's membrane was much thickened, a complication never before observed in keratoconus. The stratification visible in this membrane (about three times the thickness of the average Descemet's membrane), disproved a congenital origin, but favored an endothelial origin.

Thickening of Descemet's membrane was also observed in two cases of hydrophthalmos examined by the writer, who also found new formed hyaline membrane in rabbits with buphthalmos. Tears of this membrane, though absent in the case under consideration, have been found in both keratoconus and buphthalmos.

In both affections the ectasia is probably the result of developmental anomalies, in buphthalmos a faulty development of the filtration angle; in keratoconus a disturbance of the corneal development. The occasional association of the latter affection with congenital anomalies (microcornea, pyramidal cataract, etc.), favors this view.

Using the Held staining method, he was able to demonstrate in the periphery of the cornea quite a dense fibre meshwork, the central more ectatic portions revealing comparatively few fibres. He thinks much importance should not be attributed to this difference because of the advanced secondary changes in the center of the cornea. An examination of the elastic tissue of the cornea, particularly in developing cases of keratoconus, will teach what part this tissue plays in the etiology of keratoconus. A. C. S.

A Case of Lenticular Change in Connection with Burns of the Cornea with Muriatic Acid.

Schmidt, Heinrich, Wilhelmshaven (*Zeitschrift f. Augenheilkunde*, March, 1910, Band XXIII, Heft 3). The author reports a case of superficial burns of the conjunctiva and cornea in which there occurred, at a later period, numerous fine round greyish-white opacities, some very minute, located in the cortex of the lens. They were evenly scattered and seen only by oblique illumination. By direct ophthalmic examination the eyeground was normal aside from a faint haze of the media (cortex). The vision was 0.7 of normal. Five months later the condition was nearly the same, though the vision was but 0.5 of normal. The author deems it highly important that the oculist examine the lenticular condition in all cases of acid burns of the eye on account of its relation to accident insurance. F. K.

Iron Slivers in the Lens Without the Formation of Cataract and the Treatment.

Paderstein, Berlin. (*Klin. Monatsbl. f. Augenheilk.*, July, 1910), records a case where a comparatively large piece of iron had remained in the iris and lens for about six years without irritation or production of cataract or with important damage to the eye. It was removed with forceps, but considerable force was necessary. Only a localized opacity of the lens remained.

The author concludes, as the result of a study of the cases in literature that: 1. As a rule, aseptic iron slivers entering the lens produce cataract. 2. Exceptionally such splinters heal in the lens without the production of cataract (longest retention thirty-two years). 3. Occasionally it is possible to remove such splinters without producing cataract. 4. There is no way of knowing whether in a given case the lens is going to tolerate the foreign body. 5. There is no method of extraction by which the production of cataract can be prevented. 6. Nevertheless, if the other eye is normal, the attempt at immediate extraction through the wound of entrance is indicated. If it is impossible to remove it through the wound of entrance, the method of Elschnig, the removal in two sittings by aid of an artificial peripheral discission wound, is proper. 8. If the splinter is located in the quiet better (working eye), and the lens is clear while the other eye is functionally weak, delay is neither dangerous nor contraindicated. W. Z.

The Anatomy of Stripe Formation After Detachment of the Retina.

Roenne, H., Copenhagen (*Arch. f. Ophthal.*, Vol. LXXV. p. 2.) According to Roenne, reattachment of the retina may be effected either by a simple reattachment of the membrane or by the formation of connective tissue between retina and chorioid, the latter giving use to the ophthalmoscopic picture—retinitis striata. Roenne's findings in a case exhibiting strip formation essentially agree with those of Müg'ich and Uhthoff. Large subretinal depositions on the chorioid seem characteristic of the affection. In the author's case these were composed of connective tissue (v. Gieson stain), whereas Müglich considered the formation organized dotted fibrian. His observations, however, are open to question, since no specific stain was employed. It is possible that these subretinal masses primarily represented a fibrian-like exudate.

In Roenne's case and partly in Müglich's and Uhthoff's cases no marked atrophic changes were found in the chorioid. The white areas in the fundus without a doubt therefore were caused by the connective tissue beneath the retina. The term chorioretinitis striata is consequently incorrect; the affection is not chorioidal and it is not an inflammation.

A. C. S.

Thrombosis of the Superior Nasal Vein of Syphilitic Origin.

Puscariu, Jassy (*Klin. Monatsbl. f. Augenheilk.*, July, 1910), records a case in which the ophthalmoscopic picture was that of obstruction of the superior nasal vein of the retina in a man 28 years of age, who had had syphilis three years previously. The diagnosis was not confirmed anatomically.

W. Z.

Separation of the Retina Together With the Papilla from the Optic Nerve.

Klauber, Innsbruck, (*Klin. Monatsbl. f. Augenheilk.*, April, 1910). The patient, a man 28 years of age, was struck in the right eye by a cylindrical piece of steel 1 cm. in diameter. The f. b. rebounded. The patient worked out the day. Ten days later there was conjunctival and ciliary congestion with a precipitate on the posterior surface of the cornea and the anterior surface of the lens. The pupil was semi-dilated. No fundus view. No evidences of a wound. V.=L.P. T.N. An iridectomy was made but the eye had to be enucleated for secondary glaucoma six weeks from the time of injury. The interesting histologic findings were a small f. b. in the vitreous behind the lens. A purulent and plastic iridocyclitis with organized exudate extending from the posterior surface of the lens to the folded retina in the anterior section of the globe with which it was adherent. From the retina there extended vascular fibres to the organized mass surrounding the f. b. The retina was totally detached and unconnected with the papilla. In the position corresponding to the normal attachment of the retina to the papilla there was a formation of the size and shape of the nerve head. This remains of the nerve head consisted of loose connective tissue, glial tissue with infiltrate, exudate and hemorrhage in its structure. It contained the ends of both central vessels. They had degenerated walls and could be followed to the large vessels of the retina which again lead up to the mass surrounding the f. b. The case differs from those of evusio nervi optici in that there was a separation of the retina with the nerve head from the nerve as a late result of a combined injury (iron splinter and contusion) through plastic inflammatory phenomena. W. Z.

A Case of Retino-Chorioiditis Juxta Papillaris (Edmund Jensen). Chorioretinitis Parapapillaris.

Blessig, Petersburg (*Arch. f. Ophthal.*, Vol. LXXIV). The characteristic symptoms of this affection, according to Edmund Jensen, are a chorioretinal lesion near the disk, moderate impairment of vision because of vitreous opacities and a sector-like defect in the visual field with the apex in Mariotte's spot. The etiology is obscure. Recurrences may follow. The prognosis regarding vision is favorable. In Blessig's case (a twenty-seven-year-old man) chorioretinal changes were found to the nasal side of the right disk. There were vitreous opacities and a constriction of the superior nasal artery. Vision was only moderately impaired. A sector-like defect was found in the lower temporal field, extending only to the 50° arc, however.

The author believes further investigations are necessary to clear up the etiology of retinochorioiditis juxta papillaris or chorioretinitis parapapillaris as Blessig prefers to call it, and of an allied condition—isolated (solitary) peripheral chorioretinitis. A. C. S.

Primary Glaucoma (Iridocyclitis Anterior Adhesiva Knies).

Ischreyt, Libau (*Klin. Monatsbl. f. Augenheilk.*, August, 1910), concludes from the microscopic study of an interesting case of primary glaucoma that: 1. There is a form of chronic inflammation in the region of the anterior filtration area which can lead to peripheral iris synechia and to a thickening of the sclerocorneal reticulum, but which is clinically invisible. 2. The synechia begins with an attachment of the root of the iris to the anterior margin of the ciliary body and extends forward to the corneal margin. It may be assumed that the anterior chamber in the region of the section of the corneoscleral reticulum was retained for some time and the adhesion of the iris to the cornea preceded it at first only at the site of the iris margin. 3. The extensiveness of the inflammation makes it likely that it was produced by irritative fluids leaving the eye through the normal excretory passages. 4. From our knowledge of the exchange of fluids within the eye it is likely that these conditions would lead to hypertonus and to incipient glaucoma. The views of Knies are thus supported. W. Z.

Contribution to the Knowledge of Affections of the Optic Nerve in Diseases of the Posterior Accessory Sinuses of the Nose.

DE KLEIJN, A., Utrecht (*Arch. f. Ophth.*, Vol. LXXV, p. 3), summarizes the most important results of his investigations as follows (in abstract):

1. In disease of the sphenoidal sinus and posterior ethmoidal cells the most frequent optic nerve complication is an axial retrobulbar neuritis.

2. The first manifestation of this symptom consists in an enlargement of the blind spot to which van der Holve first called attention.

3. This symptom is of therapeutic importance, justifying operative interference in cases with enlargement or enlarging scotoma.

4. The occurrence of this symptom should suggest disease of the sphenoidal or post-ethmoidal sinuses. Disease of the anterior sinuses seldom causes an axial neuritis.

5. In the etiology of axial neuritis, circulatory and toxic elements play an important part.

6. In all affections of the optic nerve and in detached retina of unknown etiology, opening of the sinuses is justified, even though the rhinologic examination be negative.

7. Contrary to Lapersonne's and Thers' views, bilateral papillitis may follow sinusitis not only because of anatomic

conditions but because of the frequent bilateral occurrence of posterior sinusitis.

8. The likelihood of the occurrence of optic nerve complications in ozena necessitates a careful examination of the optic nerve in every case of ozena. A. C. S.

A Contribution to the Relationship Between Inflammations of the Optic Nerve and Diseases of the Nose.

Jung, J., Cologne (*Arch. f. Ophth.*, Vol. LXXIV, Festschrift), reports the clinical histories of two cases in which visual disturbances followed a purulent posterior ethmoiditis. In both cases the visual impairment was bilateral. In the first case the disks were much swollen, in the other although absolute amaurosis existed, no fundus abnormalities were present. As vision improved under treatment, an absolute bilateral central scotoma could be demonstrated in both cases. He emphasizes the importance of searching for a central scotoma in cases of visible optic neuritis of doubtful etiology. Having excluded multiple sclerosis, the discovery of this sign should suggest sinus disease. Treatment consisted in applications to the nasal mucose of cocain-suprarenalin solution combined with suction. In the first case vision in O. D. reached 5/10 +, in O. S. 5/12 +; in the second, vision at the time of the last visit was 5/15 in O. D., 5/18 in O. S.

A. C. S.

Evulsio Nervi Optici Partialis.

Birkhauser, Bern (*Klin. Monatsbl. f. Augenheilk.*, April, 1910). This rare condition was observed in a man 29 years of age, and resulted from a thrust from a cow's horn, directed from below. There was a large flap wound of the upper lid of O. S. There was proptosis of a high grade. The anterior segment of the globe appeared normal except for a subconjunctival hemorrhage. The lens and vitreous were transparent. At first glance the papilla appeared small and horizontally oval. Below this there was an almost black semicircular area which was especially sharply defined below. At the upper margin it had a greenish tinge with a hemorrhagic red beneath. The visible portion of the papilla, together with this area, made up the usual diameter of the normal papilla. The marked parallax between the border and the center left no doubt but that there was a separation of the head of the nerve in the lower-outer quadrant from its sclerotic canal. The retinal vessels were torn in this position. for they could not be traced upon the papilla. Corresponding to these vessel lesions there were four wing-shaped dark hemorrhages radiating from near the margin of the papilla. The upper margin of the papilla was ill defined. The arteries narrow and the veins dilated. The outwardly extending hemorrhage reached to the macula. T. N. V. = finger counting at 1 m. The upper half of the visual field was lost. Some months later the semicircular hemorrhage had been replaced by a white gray tissue mass which reached to the general fundus level. The retinal hemorrhages had been absorbed. The mechanism of the injury was likely that the horn entered in a direction from below upwards directly beneath the upper orbital margin whereby the upper lid was torn and the globe strongly rotated upwards. This rotation caused the posterior pole to sink so low that the nerve was torn loose at its insertion. At the same time the conjunctiva in its lower half was so stretched that a hemorrhage from its torn vessels occurred.

W. Z.

Two Cases of Evulsio Nervi Optici.

STOEWER, Witten (*Klin. Monatsbl. f. Augenheilk.*, April, 1910), reports two cases of evulsion of the optic nerve. The first was seen in a man 23 years of age, and had resulted from a thrust with an umbrella. The eyeball was luxated, but was easily replaced. Vision and movements of the globe=O., pupil irresponsive to light and too small to permit of fundus view. With dilated pupil a large gray-white mass was seen covering the papilla. The retina was whitish with numerous scattered hemorrhages. There was proptosis. Symptoms of cerebral involvement occurring, the eye was enucleated to facilitate the treatment of the probable retrobulbar inflammation. The usual resistance to the section of the optic nerve was absent and there was a penetrating wound of the sclera which probing showed to reach the roof of the orbit. The ampulliform distention of the sheath extended for a distance of 1 cm., but it was quite soft from the absence of the nerve stalk. The patient eventually recovered from the cerebral involvement and an orbital abscess. Vitreous, blood and fibrin had penetrated the sheath of the nerve.

Anatomically the optic nerve was completely detached at the sclera, but the complete defect to the vitreous was present centrally for a diameter of 1 mm. At the margin of the defect there remained more or less of the lamina and fibres of the nerve. The retina in the vicinity of the papilla was elevated by a hemorrhage. The vessels were for the most part collapsed. A conical shaped compact hemorrhage extended into the vitreous with its base anteriorally.

The second case occurred in a boy 9 years of age. The eye had been injured fourteen days previously by a stick thrust. There was a 1.5 cm. cicatrix in the conjunctiva beneath the cornea. V.=O. No iris-response to light. The ophthalmoscope showed, in the position of the papilla, on the general fundus level, a white avascular disk. This had an extension upwards and inwards 1.5 times the diameter of the papilla. Below there was a sector of the retina which was of a gray-white color with an overlying retinal vessel. Eight months later there were hemorrhages, localized opacification of the retina, and blood vessels only visible peripherally. Two years later lenticular opacities prevented a view of the fundus. The author considers that the diagnosis of evulsio nervi optici rests upon three cardinal symptoms: 1. The absence of the characteristic vascular papilla, or, if a view is possible, of the presence of a hole at the position of the papilla. 2. Interruption of the circulation of the retina; a symptom likewise apt to be obscured by vitreous hemorrhages. 3. Total blindness with loss of direct pupillary reaction. The diagnosis would be further supported by a history of the characteristic form of injury. W. Z.

On the Pathology and Therapy of Orbital Cellulitis—Marked Bending and Lacunar Fiber Degeneration of the Optic Nerve.

Birch-Hirschfeld, Leipzig (*Arch. fuer Ophthal.*, Vol. 75, Part 2), reports a case of orbital phlegmon in a six-year-old boy in which the whole orbital content obtained in vivo was subect to microscopic examination, revealing thrombophlebitis with multiple abscess formation and infiltration of the entire orbit; also swelling of the nerve head and laceration of most of the nerve fibres due to a sharp, lateral bending of the nerve without demonstrable inflammation of the nerve trunk or thrombosis of the central vessels however.

Free incisions had resulted ineffectually, necessitating exenteration of the orbit, which aided perhaps by collargol treatment (Crede), brought about a favorable termination.

A. C. S.

Retrobulbar Orbital Cellulitis.

FEJER, JULIUS (*Cent. f. Prakt. Augenheilk.*, August, 1910), reports a case of injury to the orbit where there was severe cellulitis with exophthalmos, chemotic conjunctiva and beginning choked disk. He made a free incision into the orbit above and outward at the site of injury and a counter drain to the inner side. In spite of frequent douching the patient continued to grow worse, with increased pain and vomiting. Finally, on the nineteenth day after the injury, when he had decided to place the patient under an anesthetic and enucleate, while washing out the wound, a stick of wood 16 mm. long and 5 mm. wide, the end of a penholder, was discharged. Therefore further interference was delayed. The patient rapidly improved, and eventually secured vision of 5/10. Fibrolysin was injected to prevent artrobulbar scar formation.

M. W.

Transitory Hyperopia in Diabetes.

LUNDSGAARD, Copenhagen (*Klin. Monatsbl. f. Augenheilk.*, July, 1910). The fact that the author has observed three cases of transient hyperopia with diabetes causes him to believe that the condition is more common than is usually supposed. The notes of his late two cases are given. The first was a woman 50 years of age. The symptoms of diabetes had been present for six months. Vision had been failing for several weeks, with periods of remission, but had been much worse for five days preceding the examination. In O. D., H. 3 D. V. = 6/6; O. S., H. 3.50 D. V. = 6/6. Accommodation normal. Tension and fundus normal. In three days vision began again to improve, and at the end of a week the eyes were Em. When first examined the per cent of sugar 0.2%, and at the time the eyes were Em. it amounted to a trace.

The second case was also in a fifty-year-old woman. Diabetes had been known to be present for six months. For three weeks after sudden failure of vision she had been obliged to read with a loup and the vision in O. S. was distorted. O. D., H. 1.50 D. V. = 6/6; O. S. H. = 2 D. V. = 6/12. Under high magnification the lenses were seen to contain gray punctiform opacities and vacuoles. The case was observed carefully with the ophthalmometer and tonometer over a period of two months under varying amounts of sugar. The opacities did not disappear with the H., but later there was a slight clearing. As the result of these studies the author asserts that the decrease in the hyperopia did not occur pari passu with the diminution of the sugar. The changes in the refraction were not associated with a change in intraocular tension, nor with a change in the curvature of the lens. He concludes that the cause of the hyperopia was changes in the lens, and that this is confirmed by the presence of opacities. W. Z.

On the Relation of Phlyctenular Ocular Inflammations to Tuberculosis.

Rosenhauch, E., Krakau (*Arch. fuer Ophthal.*, Vol. 76, Part 2), summarizes the results of his investigations as follows:

1. A positive Moro tuberculin reaction is indicative of a probable non-encapsulated or latent tuberculous focus.

2. The Moro tuberculin ointment reaction in individuals with phlyctenular ocular inflammation was positive in 96 per cent.

3. The tears and the secretion of the normal conjunctival sac possess almost no opsonic properties.

4. The opsonic index for staphylococci in the secretion of eyes with phlyctenules is variable, depending on the disease state; the opsonic index for tubercle bacilli, on the other hand, remains unchanged.

5. In the blood serum of individuals with phlyctenular disease, alterations in the disease process cause neither a variation in the opsonic index for staphylococcus aureus nor for tubercle bacilli.

6. If an eye with phlyctenules is irritated with dionin, the opsonic index of the blood serum for both staphylococci and tubercle bacilli remains unchanged, arguing against the presence of these microorganisms in the phlyctenules.

7. Phlyctenules histologically exactly resembling the human variety may be produced in the animal eye experimentally—

(*a*) In tuberculous animals by the introduction of yellow staphylococci (more rarely other bacteria for ex. Morax-Axenfeld bacilli) into the previously irritated conjunctival sac (by massage or needle).

(*b*) In healthy animals after subcutaneous tuberculin injection and introduction into the conjunctival sac of either living or dead yellow staphylococci or their toxins.

8. No phlyctenules were obtained—

(*a*) In healthy animals after the introduction into the conjunctival sac of yellow staphylococci or other bacteria according to the method outlined in par. *7a*.

(*b*) In tuberculous animals, provided no pathogenic bacteria (particularly no staph. aureus) were introduced into the conjunctival sac, the absence of such bacteria being established prior to the test.

9. In the phlyctenules examined histologically and bacteriologically, neither tubercle bacilli, staphylococci, nor other bacteria were found.

10. The conclusion he derives from these observations is that phlyctenular ocular inflammation is the result of the combined action of internal toxins (tubercle bacillus) with external poisons (toxins of other microorganisms, particlarly of staph. aureus). R. C. S.

The Etiological Significance of Syphilis and Tuberculosis in Diseases of the Eye.

IGERSHEIMER, J., Halle (*Arch. fuer Ophthal.*, Vol. 76, Part 2), concludes his long article with these deductions (in abstract):

Syphilis (*in general*).—(*a*) A marked positive Wassermann reaction is indicative of an active syphilitic process.

(*b*) A negative W. R., while not excluding a previous syphilitic infection, argues strongly against a luetic origin in fresh inflammatory processes.

(*c*) Incomplete inhibition of hemolysis is frequently observed in clinically terminated luetic processes.

(*d*) Gummatous processes often give negative W. R.

The value of serodiagnosis in ophthalmology, therefore, consists principally in the fact that a fresh, inflammatory ocular process clinically suggestive of lues in general, may be considered luetic when the W. R. is strongly positive, and nonleutic when the findings are negative.

In hereditary, leutic individuals (especially in those who have or have had parenchymatous keratitis) the W. R. is often strongly positive.

The severity of the infection in hereditary lues is shown by—

(*a*) The non-disappearance of the W. R. even after long continued mercurial treatment.

(*b*) The occurrence of weakly positive W. R., even in the fifth decade of life.

(*c*) The mothers of hereditary luetic children for the most part exhibited positive W. R. This is in accord with the findings of previous investigators and in opposition to Colles' law.

(*d*) The examination of the offspring of luetic parents showed that the older clinically normal children generally gave a negative W. R. Positive reactions in children with latent clinical symptoms means, in the course of time, probable manifest lues. The positively reacting children, excepting the very young, as a rule exhibited more or less marked luetic stigmata.

(*e*) Hereditary luetic pregnant women, in rare instances, may infect their children.

Syphilis (*in special tissues*).—In diseases of the *lids* and *conjunctiva*, the finding of spirochaetae assures the diagnosis. Luetic tarsitis in some cases is to be regarded as a papular and not a gummatous infiltrate.

In the etiology of primary *parenchymatous keratitis,* lues is practically the only factor to be considered. In ninety-one typical cases observed by the writer only two cases presented a doubtful etiology. The disease is due to the presence of spirochaetae in the cornea, which organisms probably invade the cornea during fetal life and then later in life, for unknown reasons, suddenly incite inflammatory symptoms.

In diseases of the *iris* and *ciliary body* the writer's statistics show that in the adult, in only 11.6% was the condition attributable to lues, whereas in children it was the chief causative factor.

A fresh iritis or iridocyclitis in the absence of secondary luetic symptoms and with negative W. R., in general should not be regarded syphilitic; even though a previous syphilitic infection be admitted—provided, of course, no anti-syphilitic treatment has been administered prior to making the test.

According to the writer's observation, in at least 85% of cases of chorioidretinal disease, lues was not the casual agent; in children, however, it was responsible for at least 60% of the cases. The rather frequent negative W. R. obtained in cases of mild anterior chorioiditis in older children with certain hereditary lues indicates that these processes occur in earliest infancy and soon after the disease terminates.

The few serological examinations so far made in albuminuric, diabetic, hemorrhagic and pigmentary retinitis show that lues apparently plays no important part in the etiology, while in embolism of the central artery leutic disease of the vessels is rather frequently observed. Excluding all possible tabetic cases, lues was found in 25% of the observed cases of optic nerve disease.

In 70% of tabetic ocular muscle palsies and in 57.4% of the remaining palsies a luetic origin could be substantiated.

Tuberculosis (*in general*).—An ocular affection in a tuberculous individual may be considered of a tuberculous nature, if a subcutaneous injection of old-tuberculin causes a local ocular reaction. Even when the reaction is negative, a reasonably certain diagnosis of ocular tuberculosis may be made in a given case, after careful consideration of the history, general and local condition, the result of therapeutic tuberculin injections, etc.

In forty-eight tubercular patients thus studied the ocular affection in 50% was most probably tuberculous.

The ocular process was then particularly generally tuberculous when a reaction followed small doses, the history and bodily examination being negative.

The anti-tuberculin test is too complex and too uncertain to be considered a diagnostic adjuvant.

Subconjunctival tuberculin injections in general exert an unfavorable influence on an existing tuberculous ocular cess.

Tuberculosis (*in special tissues*).—A critical study of the factors mentioned above, showed in thirty-four tubercular patients tuberculosis of the uveal tract in 52.3% of the cases. The diagnostic tuberculin reaction in fifty examinations was positive in 88 per cent.

Scleritic and *episcleritic* affections apparently are often of a tuberculous nature. The association of rheumatic symptoms does not exclude tuberculosis, these symptoms sometimes being due to a tubercular joint disease.

While the writer admits the possibility of a *tubercular parenchymatous keratitis,* the results of his investigations lead him to believe that the disease is extremely rare.

The author is the first to establish with certainty that tuberculosis may cause an *acute retrobulbar neuritis* with central scotoma.

Tuberculosis occasionally plays a part in the etiology of *diseases* of the *retinal vessels* and their sequelae.

A. C. S.

Vitiligo and the Eye; a Contribution to Our Knowledge of Herpetic Diseases of the Eye.

GILBERT, Munich (*Klin. Monatsbl. f. Augenheilk.,* July, 1910), gives the history of a man 38 years of age who, within a short time, developed numerous areas of whiting of the hair in all parts of the body. When examined the entire head was covered with coarse white hair, through which the rosy pigment free scalp was visible. Here and there were individual black hairs, and there was a broken circle of black hair about the forehead and neck. The cilia and the skin of the upper lids was white. The beard and mustache were white. There was extensive ptyriasis versicolis of the rump, and there were scattered areas of vitiligo. In both eyes there was iridocyclitis and neuritis much more severe in O. S. Within the small circle of the iris in O. S. were two small vascular new formations and in O. D. there were new blood vessels on the surface of the iris. At the end of treatment nine months later there was marked atrophy of the iris with absorption of the pigment of the stroma. The author says that two views of the case are possible, either that the vitiligo and the eye disease were coincidences or that they were both the expression of a common cause. After surveying the field of literature in relation to the coexistence of herpetic skin affections and diseases of the uvea and optic nerve, he concludes that: Vitiligo (poliosis) may be accompanied by inflammation of the uveal tract and optic nerve, which, aside from acute exacerbations with herpetic eruptions upon the iris, runs a very chronic course. When no apparent cause for an ocular inflammation is at hand a careful examination of the skin of the entire body should be made and perhaps oftener, and other relations between skin affections and the above described inflammations will be found. W. Z.

Abscess of the Optic Nerve and Papillœdema Resulting from Meningitis.

NAKAIZUMI, Tokio (*Klin. Monatsbl. f. Augenheilk.*, July, 1910). A youth 20 years of age, following two blows on the head, one on the occiput, the other in the temporal region, noticed that he was completely blind in his right eye. This was eight days after the second fall and one day subsequent to the onset of vomiting. Examination showed that the pupil did not react and that the papilla was swollen and covered by hemorrhages. The surrounding retina was slightly clouded. Because of the fever and headache a diagnosis of papilloedema the result of meningitis was made. Nine days later the fundus picture was that of obstruction to the circulation of the central artery, the papilla having the appearance of a glistening white mass. The patient died and the autopsy showed that the base of the brain, on the right side, over the greater area of the tract and chiasm, was covered by a greenish exudate, which extended but slightly to the left side. The spinal cord was injected and there was present a slight purulent fluid. Staphylococci were found. The only other change was traces of an old pleurisy. The right eye was enucleated with a long section of the optic nerve. On section of the nerve a thick purulent fluid exuded. Microscopic study showed an abscess in the optic nerve trunk and in the sheath; a papilloretinal inflammation and a purulent chorioiditis. Although the posterior portion of the nerve and the chiasm were not examined, the author thinks that we may conclude with some certainty that the suppurative meningitis was complicated with a purulent metastasis, which resulted in the formation of two foci in the anterior portion of the nerve and in the dural sheath with one focus, and that the choked disk was the result of the nerve abscess. The purulent chorioiditis was probably caused by the direct migration of microorganisms from the nerve abscess, as the papillary border of the chorioid lay so close to the neighborhood of the abscess that for them to penetrate required but a short journey. From the similarity of the finds to those in the case of Michel, in which bacterial emboli were present (although they were not found in the author's case), he thinks it not unjustifiable to suggest the same explanation for his case.

W. Z.

Optic Atrophy, Retinal Hemorrhages and Edema from Compression of the Thorax.

STOEWER, Witten (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910). The patient, who was a man 26 years of age, had, three days before, been squeezed by a wagon in such a manner that the head and neck received the force of the compression. He was rendered momentarily unconscious, and the only external evidences of the injury was a slight ecchymosis over the larynx and of the skin of the lids on both sides. V. = in R. E., finger counting at 0.5 m.; L. E., 4/60. In the R. E. the arteries were small and the veins abnormally wide, accompanied by streaked hemorrhages, especially about the papilla. The retina at the posterior pole was diffusely gray-white. In the L. E. veins enlarged; slight foveal hemorrhage and surrounding the normal papilla numerous gray-white flecks. Three months later the fundus of L. E. was normal; V. = 4/5; R. E. temporal half of papilla white, nasal half swollen, punctiform remnants of hemorrhages, relation of arteries to veins 1:3; nasal field contracted, V. = 2/60. Patient complained of headache throughout. W. Z.

Three Cases of Endogenous Coccic Infection of the Eye.

LUTZ, Zurich (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910). The first case was one of diabetes in a man 63 years of age. In connection with furuncles of the neck, a suppurative iridochorioiditis developed which terminated in panophthalmitis and spontaneous perforation. Micrococci in pure culture were recovered from the pus but were not found in the blood. The second case occurred in a boy, 10 years of age, suffering from furunculosis. An abscess of the sclera, involving 1/5 of the globe, developed, which perforated outwardly and healed smoothly without involving the retina. Micrococci pyogenous aureus in pure culture found in the pus.

One examination of the blood was negative. The third case was seen in a man with epidemic cerebrospinal meningitis who, on the second day, developed eye symptoms which eventuated in a panophthalmitis. On the fourth and twenty-fourth days puncture of the anterior chamber demonstrated the presence in the eye of the micrococcus meningitis. The effect of the puncture was favorable to the ocular inflammation. The infection was manifested through the formation of a ring formed corneal opacity.

The same author records that during the occurrence of an epidemic of cerebrospinal meningitis, organisms identical with those found in other cases of the disease were found in the conjunctival secretion of the eye of a boy 13 years of age, who had a conjunctival inflammation resembling that produced by the diplobacillus. W. Z.

Metastatic Ophthalmia Following a Furuncle Upon the Neck.

AUGSTEIN, Bromberg (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910). A case of panophthalmitis seen by A., was believed by him to have been metastatic because in a perfectly healthy, strong man of 24 years, with a furuncle upon the neck of 12 days' duration, immediately after a chill the vision became cloudy, and while it was impossible to determine a metastatic ophthalmia, there could be little doubt that the excitors of the pus in the furuncle—staphylococci or streptococci—found their way into the capillaries of the retina and were the cause of the destructive inflammation.

W. Z.

Choked Disk With Blindness Following Whooping Cough Cured by Trephining.

NACHT, Berlin (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910). Briefly, the history of the case was that in a girl seven years of age sudden blindness came on immediately at the termination of an attack of whooping cough. In the R. E. there was still 1 p. In both eyes there was papilloedema. Fifteen days after the onset of the blindness trephining was done and resulted in anatomic and physiologic cure. The points of interest in the case and the lessons taught are: 1. A heretofore unreported complication of whooping cough. 2. The papilloedema was caused by the frequently produced intracranial venous stasis with transudation without action of inflammation or toxins. 3. The prognosis is good where sudden blindness (probably the result of suddenly increased engorgement and compression of the optic nerve fibres) occurs (especially in juveniles) if trephining is immediately performed. Every delay is accompanied by more or less atrophy and loss of function of the optic nerve. 4. The diagnosis of complete amaurosis does not necessarily mean incurable blindness. W. Z.

Concerning the Topical Diagnosis of Hemianopsia.

Best, F., Dresden (*Muench. med. Woch.*, August 23, 1910). Recent investigations, in which Lenz and Behr have chiefly been concerned, indicate that—

(*a*) In cortical hemianopsia no straight line representing the boundary line of the visual field passes through the fixation point, the macula generally being preserved. There are no pupillary disturbances and Wilbrand's prism test is positive.

(*b*) In tract hemianopsia, including a lesion of the external geniculate body, a straight vertical line of demarcation passes through the fixation point. The pupil of the eye on the side of the hemianopsia is the wider. There is hemianopic pupillary reaction and the prism test gives a negative result. (The hemianopic pupillary reaction is best obtained by first dazzling the macula by having the patient fix a brilliant point of light for several minutes, after which the blind and seeing portions of the retina are examined by light reflected from a plane mirror. In testing the field of vision the distance of the eye from the fixation point should be greater than is usually the case in most perimeters.)

The above views are partly supported by a case of probable injury of the optic tract studied by the author. Following a gunshot wound in the right temporal region there occurred a left-sided homonymous hemianopsia. X-ray located the bullet in the region of the sella turcica to the right of the median line. The left pupil was the larger and the hemianopic pupillary reaction present. Wilbrand's prism test was negative. The vertical boundary lines of the visual field passed through the fixation point. The bullet healed in without further complications, and the patient was finally discharged with vision 5/5 in each eye. No atrophy of the disks was demonstrable. Best prescribed a 10 degree prism base out for the left eye, thus adding 5 degrees to his visual field during moments of relaxation of the fusion impulse. He thinks that in some cases turning one eye 180 degrees by surgical means might be of benefit. A. C. S.

Remarks on Hemianopsia.

Best, F., Dresden (*Archiv. fuer Ophthal.*, Vol. 76, Festscrift), comes to the following conclusions:

1. In tract hemianopsia the vertical line of demarcation passes directly through the fixation point without sparing the macula.
2. The line of separation in the hemianopic visual field passes through the mid-vertical line of the retina.
3. In tract hemianopsia, half-sided pupillary reactions occur, in cortical hemianopsia these are absent.
4. The faulty visual judgment of the hemianopsic patient is also present in the normal individual during indirect vision. The apparent shortening of objects in the horizontal plane in indirect vision is due to the fact that our visual judgment is guided not by the real size of the objects, but by the visual angle under which they appear; in differences of depth, however, the resulting difference in the visual angle is compensated. A. C. S.

The Wassermann Reaction in Eye Diseases.

Fleischer, Tübingen (*Klin. Monatsbl. f. Augenheilk.*, August, 1910), examined 273 cases of eye disease with the Wassermann test; 32.5% gave a positive reaction, 66% gave a negative reaction, and in 1½% the reaction was doubtful. In 46 cases of typical parenchymatous keratitis the reaction was positive in 40, in 2 it was in doubt, and in 4 negative; positive 87%. The average in 211 cases in literature is 81%. In 4 cases of family punctate or nodular keratitis, including punctate or ring-form keratitis in 3 families the reaction was negative; 8 cases of scleritis, 1 positive; acute serous iritis, 6 cases, all negative. Acute plastic iritis, 17 cases, 4 positive (3 tuberculous, 3 rheumatic, 7 undetermined). Juvenile iritis, 4 cases; 1 positive. Chronic iritis limited to the iris, 33 cases, 9 positive (6 tuberculous). Chronic iridocyclitis, 30 cases, 6 positive. Uveitis in general gave 20.5% positive, which the author thinks bears out his previous assertion that in his country the majority of the cases are in association with tuberculosis. In one case of pigmentary degeneration with ring scotoma the reaction was positive. In 6 cases of juvenile amaurosis without ophthalmoscopic change, all negative. The mother of one patient gave a positive reaction. In 7 cases of Argyll-Robertscon pupil 2 positive, 4 negative, 1 doubtful. In 7 cases of hydrochephalus, all negative.

He concludes that the Wasserman test is a valuable aid to diagnosis in diseases of the eye. W. Z.

A Case of Gunshot Wound in the Temporal Region With Paralysis of the Sympathetic.

Cords, R., Leipzig (*Arch. f. Ophth.*, Vol. LXXV, Part 1), reports a case of gunshot wound in the right temporal region, followed by partial, transitory paralysis of the first trigeminal branch and abducens, and complete paralysis of the trochlear and sympathetic nerves. X-ray located the bullet in the lateral side of the lower root of the small wing of the sphenoid, the structures in this region being those subsequently traversing the superior orbital fissure. For some reason, however, only the fourth, sixth and first branches of the fifth nerve were injured. The sympathetic paralysis probably resulted from a lesion of the sympathetic fibres which join the fifth nerve to the distal side of the Gasserian ganglion, most of the sympathetic fibres taking this course.

In all previously reported cases of gunshot wounds of the sympathetic, the wound of entrance was in the cervical region. A. C. S.

Panophthalmitis from Subtilis Infection Following Injury by Sliver of Iron.

Kodama, Tokio (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910). When seen a few hours after the accident a slight injury to the globe 2 mm. from the limbus was visible, but no trace of injury to the cornea or to the anterior chamber. The vitreous was clouded by opacities. Following day ring abscess with beginning panophthalmitis, the eye was enucleated. From the conjunctival secretion only the xerosis bacillus was recovered, but from the vitreous typical bacilli subtilis were found. A piece of steel was found in the vitreous 3 mm. from the posterior wall of the globe. A study of f. b. injuries where the b. subtilis is the excitor of the inflammation, leads the author to the following conclusion:

The patients are usually young men, and the work is usually connected with the soil. Right eye is more commonly affected because turned more towards the work. The perforation is usually corneal, rarely scleral. The f. b. is usually iron, occasionally stone. The hay b. is the usual excitor, although mixed infections occur. Purulent infection of the vitreous is most common; infection of the anterior chamber and the cornea rare. The panophthalmitis due to the b. s. has a rapid course. In fifteen hours there are marked symptoms of inflammation and in twenty-four hours there is the complete picture of panophthalmitis; on the third day there is recession of the inflammation; on the fourth day the lid swelling and the chemosis is very slight; on the fifth day only bacilli in amorphous form are found and only very few in number. According to the author's findings the bacilli are especially numerous in the periphery of the vitreous, especially between the pigment layer of the retina and the lamina vitrea. In subtilis infection phagocytosis is especially marked. According to the author's animal experimentation, in panophthalmitis due to the b. s., ring abscess appears not rarely. W. Z.

Cases of Ectogenous Panophthalmitis.

Lutz. Zurich (*Klin. Monatsbl. f. Augenheilk,* July, 1910). Out of 13 cases of ectogenous panophthalmitis observed in the course of three years, Lutz found 3 cases in which the organism was an anaerobic bacillus, 87 in which it was the streptococcus lanceolatus, 3 of these were the result of injury and 4 following operations. Streptococcus was never found in cases of panophthalmitis from metal chipping. In 2 the bacterial examination was negative and in the remainder the b. subtilis was found, four times in pure culture and twice with an anerobic. In all of the subtilis infections the clinical picture was the same; enormous rapid development of the panophthalmitis with relatively slight participation of the surrounding tissues, and no constitutional symptoms. In the first of the anerobic cases four days after injury (striking the eye upon a shoe scraper) besides other organism there was demonstrated an organism with the characteristics of the *bacillus phlegmonis emphysematosae.* In the second case about 36 hours after the extraction of a large sliver of iron from the vitreous, panophthalmitis developed and the eye was enucleated three days later. The same organism as in the first case, in pure culture, was found.

In the third case the eye was injured while hoeing turnips. Purulent inflammation occurred within twenty-four hours and a few days later was accompanied by a peculiar stinking, stringy discharge. Enucleation was then performed. The bacterial investigation disclosed the presence of an organism which resembled the one v. Hibler designates as the organism accompanying putrefaction of albumin, but a positive diagnosis was not possible.

The author considers the bacterial findings in a case of injury to the eyeball of much importance in determining whether or not to enucleate in the florid stage of panophthalmitis. In the presence of pneumococci or streptococci a new wound forms a favorable culture floor for fresh colonization, and it is especially to be avoided in performing enucleation not to open the globe. It is, therefore, advisable in such cases to wait a few weeks after infection before removing the globe. In subtilis infection the conditions are favorable for immediate enucleation. W. Z.

The Treatment of Sympathetic Ophthalmia With Large Doses of Sodium Salicylate or Aspirin.

Gifford, Omaha (*Klin. Monatsbl. f. Augenheilk.,* May and June, 1910), satisfied from several recently reported cases in foreign literature of sympathetic ophthalmia with bad outcome, that the method of treating s. o. with huge doses of sodium salicylate is still unknown to some, describes his manner of using the drug, and recapitulates his results in the treatment of 16 cases, which were as follows: 2 bad where the treatment was inaugurated too late or was not well borne; 1 moderately good; 1 good, and 12 very good. Most of the cases came under treatment within a week of the onset of the disease. With one exception the exciting eye was removed at once. One case which remained well for 18 months, was attacked with glaucoma, which seemed to reawaken the sympathetic inflammation; however that may be, the eye was lost.

The author states that in so serious a disease he does not consider it wise to rely upon one drug, so that he combines with this treatment mercurial inunctions, and at times hypodermics of atoxyl or arsenic in another form. Atropin is used locally. W. Z.

Disinfection of the Skin With Tincture of Iodin in Eye Operations.

Segelken, Stendal (*Klin. Monatsbl. f. Augenheilk.*, July, 1910), has employed this method in seventy-five operations representing the majority of operations usually performed, and has never encountered a disturbance of the wound or other harmful complication. Erythema and more or less pronounced edema of the lids in predisposed persons were observed. The method was to paint the lids for a distance of 2—3 cm. from the free borders until the skin was of a light to dark brown tint. W. Z.

The Employment of Jets of Steam in the Treatment of Diseases of the Eye.

Perlmann, Iserlohn (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910), summarizes the action and employment of streams of steam in the treatment of ocular conditions as follows: Its action upon the skin, lids, conjunctiva and cornea is that of an analgesic and anesthetic; it increases blood and lymph metabolism; it increases the temperature. It may be employed in neuralgic and rheumatic affections; inflammations of the skin, lid margins, and tear passages. To improve the hygiene of the skin by increasing glandular activity (combined with advantage with massage of the skin). In certain forms of chronic catarrhal conjunctivitis to prepare the membrane for the stimulant. If the corneal tissue is softened by some drug, such as holocain, it makes the deeper structures accessible to steam medication and aids in the ripening and absorption of cataracts. W. Z.

Investigations Into the Bactericidal Power of Zinc and Copper Iontophores.

Wirtz, Duren (*Klin. Monatsbl. f. Augenheilk.*, July, 1910), concludes, as the result of experiments upon animals, that in a fresh infected corneal ulcer the pathogenic organisms are either destroyed completely or their number is so diminished and their virulence so lessened by the employment of zinc iontophores of 2 M.-A. applied with the No. IV corneal electrode, that the attacked tissues reassert their vitality and the organisms are inert to healthy tissue. The energetic bactericidal action of the zinc iontophores was so incontestably proven by these experiments that the investigator sees in the zinc iones an important curative agent against infectious processes. W. Z.

Hay Fever Conjunctivitis.

Ascher (*Woch. f. Ther. u. Hyg. d. Aug.*, September 15, 1910) believes in prophylactic measures to prevent conjunctivitis in hay fever, rather than treating it after once started. He uses the following prescription:

Sol. corticini	3.0 :30.0
Adrenalini hydr. (1 per cent)	0.15
Cocaini mur.	0.15

Sig.—Eye drops.

From this solution he has his patients begin three weeks before the time for his attack, to drop from four to six drops in each eye three or four times a day, and instructs them to allow the drop to run down into the tear sac. Also, shortly before the critical time, he strengthens the solution and also has them paint the inside of the nose with the solution. He claims that all patients are greatly benefited, and some are spared all traces of their former uncomfortable condition in the nose as well as the eye. M. W.

On the Therapy of Blenorrhoea by Means of Blenno-lenizet Ointment.

Kuemmel, Erlangen (*Munch. med. Woch.*, July 12, 1910), in two bilateral cases of gonorrheal conjunctivitis, in which one eye was treated with blenno-lenizet ointment, the fellow eye with silver nitrate found that the eyes treated with silver returned to normal and the bacteria disappeared more rapidly than those subjected to the ointment. He has, consequently, abandoned this form of treatment. A. C. S.

The Use of Naftalan in External Diseases of the Eye.

Vogt, Aarau (*Klin. Monatsbl. f. Augenheilk.*, August, 1910), has found naftalan, particularly in the following combination, of value in the treatment of scrofulous external diseases of the eye: Naftalin, 20.0; zinci oxyz., amyl tricit, aa 10.0. W. Z.

Mastex Dressings.

Daxenberger (*Woch. f. Ther. u. Hyg. d. Aug.*, July 28th, 1910) advocates the use of mastex-chloroform solution as a substitute for collodion, etc., in eye dressings. The application is clean and non-irritating to the skin. M. W.

The Ocular Injuries Caused by Atoxyl.

Birch-Hirschfeld and Koester, Leipzig (*Arch. fuer Ophthal.*, Vol. 76, Part 3). The writers report two cases of amblyopia complicating the treatment of psoriasis by atoxyl injections.

In the first case, a forty-year-old man, 9 g. of atoxyl were administered over a period of two months. There was first noted slight visual impairment without fundus lesions, followed in a short time by rapid deterioration of vision and eventually primary atrophy of the disks. Though one eye became totally blind, the direct reaction to light was preserved. The other eye retained comparatively good central vision, but the field was much contracted.

The second patient, a fifty-three-year-old alcoholic, received 32 injections of 20% atoxyl during a period of five weeks. Vision rapidly fell to light perception, and the right disk became atrophic in appearance. (The left disk was invisible because of lenticular opacities.) The pupils reacted promptly to light, both directly and indirectly.

This case came to autopsy, the pathologic diagnosis being interstitial alcoholic hepatitis and gumma of the liver. The internal organs were unaffected by the poison, showing that the ocular lesions were the direct result of the circulating poison. The writers, however, concur with other observers that luetic degenerations and those traceable to alcoholic abuse probably predispose to the destructive action of atoxyl. The eye, optic nerve and primary optic nerve centers were obtained for microscopic examination, which disclosed signs of advanced atoxyl poisoning. The third neuron extending from the ganglion layer to the internal geniculate body appeared almost entirely degenerated. The nuclear layers, especially the external layer, were less involved, suggesting later degeneration of the first and second neurons. The relatively late manifestations of optic atrophy in the fundus suggested a primary lesion of the third neuron posteriorly, perhaps near the optic foramen. The condition was without doubt a primary nerve degeneration leading to simple progressive atrophy of the optic nerve.

The retention of prompt pupillary reaction to light may perhaps be attributed to the less marked degeneration of the cone nuclei (connected with the pupillo motor function of the retina) or to the fact that the pupillary fibres in the nerve trunk are more resistant to the poison.

Igersheimer has shown that atoxyl amblyopia is not an arsenic or aniline amblyopia, but due to the circulating unreduced atoxyl or to its more toxic reduction product. The toxic dose varies with the individual. While Darier claims that a single dose of .5 g. of the French preparation is nonpoisonous, the authors insist that the drug be abandoned as a therapeutic agent.

Of clinical interest is the peculiar manner in which the visual disturbance develops, the unfortunate termination and the difficulty of diagnosis during the incipient stages. Blindness is generally inevitable when the first signs of visual impairment become manifest; such being the case in 45 of 46 cases. In most of the reported cases in which a field examination was possible, the fields were found much contracted. A central scotoma does not occur. The pupils usually were small or of medium size and reacted promptly to light, even in cases of absolute amaurosis.

The experimental investigations conducted by the writers in dogs and rabbits subjected to atoxyl injections revealed ophthalmoscopic and pupillary conditions similar to those observed in atoxyl poisoning in the human. In several animals, although fundus and pupils appeared normal, decided structural changes were found in the retina and optic nerve. While the retinal lesions seemed the more pronounced, there was no positive evidence in favor of ascribing the nerve degeneration as secondary to a primary retinal lesion. The circulating poison probably acts deleteriously on retina and nerve simultaneously. A recent true degenerative process was found in the medullary sheaths of the optic nerve fibres. In the protoplasm of the retinal ganglion cells there was found partial or complete chromatolysis, agglutination of the chromatophile elements with overstaining of the cell protoplasm, vacuolization and dissolution of the protoplasm, swelling of the nucleus, displacement, irregular shrinkage and dissolution of the nucleus. Degenerative changes analogous to those seen in the eye also occurred in the nuclear layers. The ocular pathologic changes in a dog placed on a prolonged alcohol diet were rather more pronounced; still, this animal received the largest number of atoxyl injections.

Although it was established beyond a doubt that atoxyl injures the brain cells, they were unable to show that one region was more susceptible than another. The authors believe atoxyl attacks the tissues everywhere simultaneously, the possibility of a lesion depending on individual predisposition.

A. C. S.

Ehrlich-Hata 606 in Ophthalmology.

Stuelp (*Woch. f. Ther. u. Hyg. d. Aug.*, September 8, 1910) gives a review of the methods of using 606, with the results of various authorities, and especially what has been done in the domain of ophthalmology. He attributes the small percentage of ophthalmic cases to be due to caution on account of some of the horrible results of other arsenical compounds, especially atoxyl. Among the cases which he has collected up to date on which 606 has been used are the following:

1. Four cases by Neisser. (*a*) Brain lues, six months after infection, with choked disk, eye muscle paralysis and severe headaches; which was relieved completely and rapidly of all symptoms after injection of 0.2 of 606, when K. I. and Hg. had had no effect. (*b*) Three cases of interstitial keratitis without results.

2. Six cases by Wechselmann. (*a*) Optic neuritis, which had resisted the influence of Hg., rapidly cured with 606, with normal vision restored. (*b*) Five other cases with abnormal optic nerves without 606 producing any harmful results.

3. Two cases by Treupel. (*a*) Syphilitic keratoiritis with

positive Wasserman; cured eight weeks after injection of 606. Three months later returned, with slow healing after a second injection. (*b*) Paralysis of left side, with ptosis, and paresis of left internal and external recti following apoplectic attack. Showed rapid improvement after injection of 0.3 of 606 with slight paresis of recti and slight ptosis remaining.

4. Four cases by Gluck. (*a*) Interstitial keratitis which had been under treatment for one year with Hg., showed rapid clearing immediately, but three weeks later were still hazy. (*b*) Very severe iritis with synechia. Photophobia disappeared two days after injection of 0.4 of 606 with complete cure in four days, with the exception of the synechiæ, which had disappeared eight days later under atropin. (*c*) Double iritis cured three weeks after injection. (*d*) Optic atrophy. No result.

5. Dorr. One case of diplopia cured in three weeks.

6. Two cases by Hoffman. (*a*) Exophthalmos and abducens paralysis in hereditary syphilis rapidly cured after injection of 606. (*b*) Tertiary iridocyclitis and hyalitis. No results given after the treatment.

7. One case by Igersheimer. Interstitial keratitis. Negative results.

8. Ehrlich. Excellent result in retinitis syphilitica and iritis-gummosa.

9. Axenfeld. Rapid recovery of a case of iris-gumma.

He deprecated the fact that ophthalmologists have not been giving 606 for a special trial in eye cases, and also that the preparation is not yet on the market. He states that Ehrlich is still working to improve the preparation, and has already discovered "Hyperidial," which is called Hy. for short. Its poisonous effect is said to be one-third that of 606. M. W.

606 on Ophthalmology.

COHN, PAUL (*Woch. f. Ther. u. Hyg. d. Aug.*, October 6, 1910), reports a case of iritis of right eye with one-tenth vision, of eight days' duration, who had been under treatment in a Berlin skin clinic for a skin eruption and had been given 606 two months previous and discharged as "cured" a few days later. He was unable to follow the case. M. W.

The Value of Optico-Ciliary Resection.

LOEHLEIN, W., Greifswald (*Arch. f. Ophth.*, Vol. LXXV, p. 2). Microscopic examination of 6 eyes on which optico-ciliary resection had been performed two and one-half, four and one-quarter, five and one-half, seven, seven, and seven and one-half years previously, showed that in the majority a regeneration of the posterior ciliary nerves had occurred by partial or complete restitution in the original nerve paths. In most eyes an irregular proliferation of medullated nerve fields was observed at the posterior pole, in two cases leading to the formation of an extensive scar neuroma. In not one of these cases was a return of pain noted. However, excepting one case of sarcoma of the chorioid, no acute inflammatory or glaucomatous processes which could have caused pain were present at the time the control examinations were made. With the exception of the eye with sarcoma, the eyes were enucleated for cosmetic reasons. In the former eye, resection was done to forestall possible sympathetic inflammation (cataractous lens, Descemetitis, normal tension, no pain). Five and one-half years later the patient returned with an orbital tumor.

These anatomic findings with the experiences derived from a large number of clinical cases (prevention of sympathetic inflammation, 9 cases; absolute primary glaucoma, 8 cases; absolute secondary glaucoma, 30 cases; other cases, 10) indicate that the operation a priori is to be considered in cases of painful blind eyes when other operative procedures have failed or promise little and only the choice remains between enucleation and resection; that pain, however, will only be permanently relieved with certainty in cases in which the cause of pain does not remain permanently.. Thus, in primary glaucoma the results were very poor, whereas, in secondary glaucoma in the majority of cases the relief from pain obtained was permanent, probably not because regeneration did not take place, but because when such regeneration was effected, tension, the cause of pain, had disappeared.

For similar reasons favorable results might be anticipated in chronic iridocyclitis, phthisis dolorosa, keratitis vesiculosa, filamentous keratitis, etc. Nevertheless, if all eyes are enucleated in which subsequent sympathetic inflammation is liable to follow in the fellow eye, and in secondary glaucoma, iridectomy or cyclodialysis first performed, the indications for optico-ciliary resection becomes very much limited.

Furthermore, the cosmetic result is frequently unsatisfactory. In most of the cases of secondary glaucoma phthisis bulbi followed. Still, this would probably have occurred anyhow. An "atrophy" due to resection apparently does not exist. A squint position, too, can hardly be avoided. In some cases of course the cosmetic effect is of secondary importance.

In no case of painful blind eye in which tumor is suspected should resection be performed, not even if enucleation be refused. A. C. S.

A Contribution Towards the Perfection of May's Symblepharon Operation.

Haitz, Mainz (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910). This article contains an analytical study of the evolution of the May operation for symblepharon with modifications proposed by the author, the important one of which is that in the dissection of the symblepharon the undermining must be directly downwards, thus avoiding the contact of the implanted graft with the inferior rectus, and keeping it separated therefrom by loose connective tissue, thus securing considerable mobility to the flap and avoiding postoperative diplopia. Operations for total inferior symblepharon should have for their object immediate and firm union between the transplanted skin and the septum orbitale from the lid margin to the orbital margin. He prefers the Wolfe-Krause graft, and finds that celluloid, such as can be obtained from the opticians in the form of an eye shield, affords excellent material for the plate. Its advantages are that it is light, thin and elastic, and possesses a curve such as is required for the plate, and is a poor conductor of heat. The perforations are arranged in pairs and double armed sutures are used. The two ends of the suture are tied over a roll just beneath the cilia. The author reports a case in which a very successful result was obtained. W. Z.

Blepharoplasty With a Skin-Cartilage Flap.

Meisner, Konigsberg (*Klin. Monatsbl. f. Augenheilk.*, July, 1910). The patient on whom Meisner performed his modification of Budinger's operation was a woman 72 years of age, with a carcinoma of the lower lid which extended from the free border to a width of 4-5 mm., and included the middle 3/5 of the lid. The eyeball was uninvolved. Under local anesthesia the growth was extirpated by incision carried around it in the healthy skin, so that skin and conjunctiva were removed from the punctum to the outer angle. A graft the shape of the excised tissue, but on all sides about 1/3 cm. larger, was removed from the helix of the left ear, including the entire thickness, so that the cartilage was covered on both sides with skin. This wedge was then set in the defect in the lower lid in such a manner that its anterior surface was in contact with the globe. The margins of the wound were then sutured on both the conjunctival and skin surfaces to the graft. The eye was then closed, smeared with boro salve and bandaged. For several days the graft appeared blue. On the eighth day the sutures were removed, healing having taken place primarily. Unfortunately, the growth reappeared in the portion of the lid preserved and it was necessary to remove a triangle which included a small section of the transplanted cartilage. Microscopic study of this tissue showed that only the tissue nourished by the perichondrium was normal. In other places there was a degeneration and a slight absorption diffusely affecting the body of the cartilage, but more intense and somewhat localized at the margins of the wound. The spaces were replaced by connective tissue, but in the body of the graft there was a sort of condensation of the remaining elements. The form of the graft was, however, unchanged. W. Z.

A Method of Exenterating the Infundibulum of the Orbit With Retention of the Globe.

Calderaro, Palermo (*Klin. Monatsbl. f. Augenheilk.*, May and June, 1910), has devised this operation because of the limitations of the Krönlein procedure, some of which, according to the author, are that the field exposed is too small for the extirpation of tumors except such as are surrounded by a capsule; it permits of no satisfactory exploration of the inner wall of the orbit, which is of such importance because of the location here of the ethmoid cells; that it forms a narrow breach when the diameter of the growth exceeds 3 cm. or when the object of the operation is the exenteration of the entire retrobulbar tissue. The author's method is to make a large flap, including both lids and the conjunctival sac and separating the eyeball from its muscles and its optic nerve. After shaving the eyebrow, disinfecting the parts and anesthetizing the patient, a skin incision, reaching down to the periosteum from the mid-line of the forehead 3 cm. above the upper orbital margin running horizontally until it reaches the upper-outer angle of the orbit, when it drops downward to the zygomatic arch, then again somewhat inwards, thus maintaining a distance of about 2½ cm. from the corresponding orbital rim. In this way the arched incision surrounds three-fourths of the periphery of the orbit. After ligating the small branches of the temporal artery this flap is dissected up from loose union with the frontal periosteum and the aponeurosis of the temporal muscle to the margin of the orbit. Here septum orbitalae is incised and the external palpebral ligament and the orbit penetrated close to the bone. With the finger the orbital cavity is now thoroughly palpated to orient the growth. The levator, the superior, the external and inferior recti, and the superior oblique are now divided as far posteriorly as the growth will permit of. The optic nerve is then divided up to the sclera and finally the internus is severed. This entire mass is now turned back downwards and inwards. In this way a thorough inspection can be made and the extent of the subsequent procedure determined, the extirpation of the tissues of the apex of the orbit and, where necessary, resection of the outer wall of the orbit carried out. The contents of the orbit with as much of the periosteum as possible is then reamed out, after which a complete removal of the periosteum is made. In one instance the author packed the retrobulbar space with gauze; in the second he transplanted fat from a rabbit's orbit. The flap is then turned back into place and sutured. An end of the gauze packing is permitted to project from the lower angle of the periorbital incision for drainage. It is removed at the end of ten days. Care must be taken to have the gauze folded that it may be readily pulled out. Stitches are removed on the tenth day. The position of the eye in the orbit is behind the usual plane (enophthalmus), and the cornea is rotated upwards and backwards. The cornea is left with a diffuse semi-transparent opacity. At the end of four months the sensibility of the surrounding skin is regained fully and that of the cornea and conjunctiva in part. A permanent complete ptosis of the upper lid results. W. Z.

Two Tumors of the Caruncula.

STEINER, L. (*Centralbl. f. Prakt. Augenheilk.*, June, 1910), reports two interesting growths of the caruncle. The one in an elderly man, about 10 mm. broad and 5 mm. thick, with a mould-like border toward the cornea; irregular surface dotted with red spots on a white background. Microscopically, an adenoma, arising from the sebaceous glands, was revealed, which, according to the author, is the fifth case published.

The other case, occurring in a 72-year-old woman, proved to be a multilocular retention cyst of the caruncle, which, from pressure, had interfered with the flow of tears, but was removed without injury to the canaliculus or punctum.

M. W.

Optic Nerve Atrophy Following Contusion of the Globe.

KUNST (*Centralbl. f. Prakt. Augenheilk.*, June, 1910) describes an injury to a young soldier, who fell, striking his right eye against a 4 cm. thick iron tube. The lids were greatly swollen with extravasation of blood. The cornea was clear with normal fundus. Globe intact with normal muscular movements. Pupil slightly dilated but slight reaction to light. Vision, large objects. Three days later the iris, which was blue, began to turn green (as he surmises, probably from blood in the ciliary body). Vision, 5/30. On the nineteenth day after the injury he was impressed that the disk appeared pale. Vision, 5/20. A few days later atrophy of the nerve could readily be made out, and a month later the nerve was white, sharply outlined, with a total excavation, and no reaction to light.

There was no family history of optic nerve trouble. Negative Wasserman. M. W.

Collargol in Ophthalmology.

DAXENBERGER (*Woch. f. Ther. u. Hyg. d. Aug.*, June 23, 1910) urges the use of collargol in sloughing ulcers of the cornea, ulcus serpens, and both for treatment and prevention of ophthalmic neonatorum. He believes in certain severe cases the unguentum Crede should also be used in the temples, over the brows, etc., in conjunction with a 2 per cent solution into the eye.

He reports a case of severe ulcus serpens, involving over half the cornea, with the anterior chamber almost filled with pus, and which had resisted all the usual forms of treatment, responds beautifully to thorough flushing with 2 per cent collargol, once daily, so that the patient recovered an acuity of 6/12, and was able to resume his work within scarcely three weeks' time. He claims an electrolytic as well as a bactericidal effect, and a stimulation to an increase of the number of leucocytes.

Its use is painless, and argyrosis should not occur if the least care is exercised. M. W.

Cocaine Idiosyncrasy.

Hirsch (*Beil. d. Wiener Augtl. Stands ztg.*, No. 9, 1910; abst. *Woch. f. Ther. u. Hyg., d. Aug.*, July 23rd, 1910) reports the case of a 20-year-old anemic, nervous girl, who became dizzy, weak, acquired a turning of the head, and was unable to sleep, after an instillation of one drop of a ¼ per cent solution of cocain. On the mornings when the drop was not put in these symptoms did not occur, but were invariably present after using the ¼ per cent solution. M. W.

Atropin in Iritis.

Oppenheimer (*Woch. f. Hyg. u. Ther. d. Aug.*, June 2, 1910) believes in not being stingy with atropin in iritis. He reports a case of a robust workman who came to him eight days after his eye had started to get red and three days after having been treated by another oculist with zinc. The pupil was entirely occluded, with just light perception. He was given cocain-atropin solution every ten minutes for three hours and two drops of adrenalin. There was no change in the pulse. Pupil oval with numerous synechiae still present. On the next morning and afternoon the same performance was repeated, while in the meantime atropin was instilled every three hours day and night. Within three days the pupil was round, with no synechiae; no signs of intoxication, and recovery in three weeks.

He claims that if one watches the pulse carefully there is no danger in this method of using atropin. M. W.

Healing of a Solitary Tubercle of the Chorioid.

FEJER, JULIUS, reported a case of tubercle of the chorioid which he presented before the Hungarian Ophthalmic Society in 1908 in the acute stage. The patient, a woman, also suffered from tuberculosis of other organs.

The tubercular focus in the chorioid was the size of a lens, with miliary knots confluently surrounding it. The outlines of the nerve head was washed and the visual acuity 4/70. Under the administration of tuberculin, the spot, as well as the other tubercular lesions, gradually disappeared.

Fejer presented the case before the same Society in 1910 as cured, with vision 5/7.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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ST. LOUIS.

The Argyll-Robertson Pupil in Nonsyphilitic Lesions of the Cerebral Peduncles.

Guillain, Rochon-Duvigneaud and Troisier (Le signe d'Argyll-Robertson dans les lésions non syphilitiques du pédoncle cérébral, Soc. de neurologie de Paris, April, 1909; abst. *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 90), had already presented a patient who, following an attempt at suicide, had a unilateral lesion of the cerebral peduncle, accompanied by the Argyll-Robertson pupil. They now presented a patient with a softening of the peduncle, accompanied by a typical Weber's syndrome. The left pupil was deformed as in tabes, dilated incompletely when the light was low, and contracted incompletely in bright light. Reaction to accommodation-convergence was normal. There was no syphilitic history. C. L.

Experimental Ocular Tuberculin Therapy.

Rollet, E., and Aurand, L., Lyon (Essai de tuberculinothérapie oculaire expérimentale, *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 1), discuss the history of ocular tuberculin therapy with its doubtful results until the time of v. Hippel, whose success was marked, especially with the recent tuberculin B. E., which cures the patient more rapidly and which cures even conjunctival tuberculosis. The results of animal experiments have not kept pace with the clinical results on man, and the authors took up the study of experimental tuberculin therapy. Two series of eight rabbits were inoculated, the first with a less virulent culture than the second, the inoculation always being in the anterior chamber. The technic of the experiment is described and the action of the tuberculin B. E. on the temperature, weight and ocular tuberculosis is given. They find that the remedy in weak doses is innocuous to rabbits and in a majority of cases results in an increase of weight. The thermic reaction did not appear until the fourth injection and independent of the dose varied from 0.3° to 1°. It was proportionate to the virulence of the tuberculosis rather than the strength of the injection. It became greater with increasing numbers of injection, i. e., a phenomenon of anaphylaxis. It was, therefore, necessary to vary the technic for each animal, since each one reacted differently. Tuberculin B. E. has a very slight action on tubercles, except those of the iris, whose regression was greatly hastened. Some of the control rabbits, however, got well spontaneously. C. L.

Heliaplegic Scotoma.

Majewski, C., Cracow (Scotôme hélioplégique, *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 52), states that the majority of cases of central scotoma due to direct action of the sun's rays are due to looking at the sun during an eclipse. Some cases have been reported, however, of this condition in people who looked at the unobstructed sun. The author's case was that of a young boy who two months before had looked at the sun through a pair of opera glasses. He had had momentary pain, followed at once by cloudiness of vision. The next day he could not read, but nothing was said by him until the beginning of the school term brought the case to light. V. = fingers at 1.5 m. The perimeter showed an absolute central scotoma in each eye. Treatment, 5% dionin and absolute rest of eyes. In one week V. = fingers at 5 m., Snellen D. = 3.0. Under K. I., vision in R. E. increased in one week to Snellen 2.25, L. E., Snellen 1.75.

since which time there has been no improvement. There is still a central positive scotoma. Ophthalmoscopically the fundi are normal. C. L.

Treatment of Ptosis by Open Frontal Blepharoplexy.

Rollet (Traitement du ptosis par la blépharoplexie à ciel ouvert, *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 49), describes his operation as consisting of four steps:

1. Horizontal incision of about 12 mm. at the level of the orbitopalpebral ridge. From each end an incision is made obliquely downward almost to the free margin of the lid. This trapezoid flap consisting of skin orbicularis is loosened up.
2. Horizontal or slightly semilunar incision in the eyebrow down to the bone.
3. Perpendicular incision joining the middle of two horizontal incisions, superficial below but down to the margin of the orbit above. The two cutaneous flaps are dissected up.
4. The cutaneous-muscular flap is drawn upwards and fixed by two rows of sutures, catgut for the muscle and silk for the skin.

This method has the advantage over Panas' of the open method and because it is a true myorrhaphy. C. L.

Sclerectoiridectomy.

Barbadault, C. (La sclérecto-iridectomie. Thèse de Paris, 1908; abst. *Revue Générale d'Ophtalmology,* 1910, Vol. XXIX, p. 73), states that sclerectoiridectomy or even simple sclerectomy may replace the simple iridectomy, provided the operation is a complete one, i. e., a fistula must be made. The operation is performed as follows: Puncture and counterpuncture in the limbus, at least 1 mm. backawrds. Excision of a strip of sclera of less than 2.5 mm. height, preferably at its corneal base, together with the limbus attachment of the conjunctival flap, which has been turned backwards over the cornea. C. L.

Iritis Treated by the Antirheumatic Serum of Rosenthal and Berlioz.

Deschamp (Iritis traitée par le sérum antirheumatismal de Rosenthal et Berlioz, *Dauphiné Médical,* 1909; abst. *Revue*

Générale d'Ophtalmologie, 1910, Vol. XXIX, p. 76), reports the case of a patient suffering from a very acute attack of rheumatic iritis of the right eye. In the anterior chamber was an albuminous exudate, almost completely masking the iris, and completely abolishing the sight, reducing it to perception of light. Two injections of the serum, 20 cc. each, caused a remarkable improvement in forty-eight hours, the exudate being completely absorbed. However, the iris was bound down by strong adhesions, which will demand an iridectomy. C. L.

Two Cases of Paralysis of the Oculomotorius Following Otitis Media.

Blanc (Deux cas de paralysie de moteur oculaire externe au cours d'une otite moyenne, *Annales des maladies de l'oreille, du larynx,* 1909, Vol. XXV, p. 192) reports two cases of paralysis of the external motor oculi in infants. The condition followed attacks of otitis media. The author claims that there was a meningeal lesion causing the paralysis, and that Gradenigo's syndrome is only a localized form of otitic meningitis, and has an uncertain prognosis. C. L.

Great Ectasia of the Lacrimal Sac, with Anosmia and Agueusia, Cured by Ablation of the Sac.

Moreau (Ectasie géante du sac lacrymal avec anosmie et agueusie disparues aprés ablation du sac, *Loire Med.,* March, 1909; abst. *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 87), presented a lacrimal sac of the size of a pigeon's egg, which he had removed. For seven years the patient had been treated by probing and lavage. A curious fact was the complete disappearance of taste and odor following the first probing, and their reappearance following the removal of the huge sac. The patient was very neuropathic.
C. L.

Symmetric and Generalized Atrophic Sclerosis of the Occipital Lobes, without Visual Troubles.

Maillard and Richez (Sclérose atrophique, symétrique et généralisée des lobes occipitaux n'ayant pas déterminé de trouble visuel, Soc. de psychiatrie de Paris, March, 1909; abst. *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 88), presented the head of a child of eight years, whose vision had always been normal, having no ocular trouble except a slight nystagmus. At the autopsy, practically no occipital lobes were found, which theoretically should have caused blindness. The authors refer to the cases of Maunoir and Förster. C. L.

Partial Optic Atrophy in Fractures of the Base of the Skull.

Cantonnet (Les atrophies optiques partielles dans les fractures de la base du crâne, *Rev. de chirurgie,* August, 1909; abst. *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 88), states that in cases of fracture of the base of the skull, the prognosis is very grave as far as vision is concerned, but one must wait a long time before making a final judgment in each case as to the final visual outcome. C. L.

Unification of Graphic Notations and Abbreviations in Ophthalmology.

Bourgeois, A., Reims (Unification de la notation des graphiques et des abréviations dans la pratique ophtalmologique, *Archives d'Ophtalmologie,* 1910, Vol. XXX, p. 465), makes a plea for the international adoption of one method of abbreviation and graphic notations, so that any oculist may always know just what the writer means. For instance, the designation of the axis of astigmatism varies in different countries. C. L.

Leucosarcoma of the Eyeball Arising from the Ciliary Body.

Puscariu, Helne, Jassy (Leuco-sarcome du globe oculaire ayant débuté dans le corps ciliaire, *Archives d'Ophtalmologie,* 1910, Vol. XXX, p. 502), reviews the six cases previously published and adds one of his own.

The patient, female, age 50, was admitted for a tumor of the left orbit. Three months earlier she had commenced to have trouble with the left eye accompanied by the development of a tumor under the cornea, but had never taken any treatment. An exenteration of the orbit was performed, the result of the operation, about six months ago, being excellent. The whole tumor was the size of a mandarin, enclosing a globe which had shrunk to the size of a small nut. Microscopic examination showed that it was a leucosarcoma arising from the ciliary body at the point of exit of the anterior ciliary veins, and which had invaded the orbit after destroying the sclera. C. L.

Azotemic Retinitis Without Albuminuria.

Cantonnet, A. (Rétinites azotémiques sans albuminurie, *Archives d'Ophtalmologie,* 1910, Vol. XXX, p. 499), states that the retention of urea in the blood in certain forms of nephritis has been known for some time. The author reports two cases, one of typical albuminuric retinitis and the other of the hemorrhagic variety, in neither of which was there a trace of albumin in the urine. In the first case there was 1.1 gm. urea to the liter of blood, and in the other there was 3.2 gms. The author concludes that in these ocular lesions an examination of the blood must supplement that of the urine. C. L.

Investigations on the Development of the Pupillary Membrane in Man.

Cosmettatos, G. F., Athens (Recherches sur le développement de la membrane pupillaire chez l'homme, *Archives d'Ophtalmologie,* 1910, Vol. XXX, p. 480), investigated the development of the pupillary membrane, the iris and the anterior chamber, as they are intimately related. They had at their disposal a score of human embryos of various ages. They first review the main features of the development of the eye, and then pass to the subject proper. It is impossible to review such a long article in the short space of an abstract, but those interested will be repaid by reading it in the original.

C. L.

The Relation of the Nasolacrimal Canal to the Middle Meatus and the Groove of the Infundibulum.

Aubaret and Bonnefon, Bourdeaux (Des rapports de conduit lacrymo-nasal avec le meat moyen et la gouttière de l'infundibulum, *Archives d'Ophtalmologie,* 1910, Vol. XXX, p. 469), made investigations to determine the anatomic relation of the nasal duct to the middle meatus as a basis for an operation uniting them into one passageway. These were done on fetuses and adults by sections and by means of radiographs. They claim that the ethmoid cells are only more or less closed meatuses and that the nasal meatuses are only open cells. The hiatus semilunaris is thus entitled to be called the meatus infundibularis. They found that the hiatus varied from a mere crevice to a more or less wide opening between the free border of the uniform turbinate and the bulla ethmoidale, of a variable depth. Its posterior extremity contains the ostium maxillare; towards the anterior part are two to four transverse folds which when greatly developed would transform it into a sinus. These folds increase in size anteriorly, and in some specimens an anterior fold limits the hiatus in front, so that the direct merging of the hiatus and the nasal duct cannot be seen. The latter commences above this fold and is distinctly separated from the top of the hiatus. The authors describe variations of these relations and then announce that they have found two types of nasal ducts, the narrow and the broad. In the former the hiatus is more separated from the bony canal, and approaches it from its middle part forward, being almost parallel anteriorly. At its superior extremity it is some millimeters from the lacrimal sac, while inferiorly it approaches more and more the canal. In the second type, the floor of the hiatus from its middle part is in contact with the bony canal and the superior cells of the hiatus surround the lacrimal sac at the level of its internal wall and posterior border, though never completely enclosing it.

These anatomic facts should be taken into consideration in extirpation of the sac and treatment of the nasolacrimal canal.

C. L.

Bilateral Papillitis in a Case of Cysticercus of the Medulla.

Pascheff, C., Sofia (Papillite bilatérale dans un cas se cysticerque du bulbe rachidien, *Archives d'Ophtalmologie*, 1910. Vol. XXX, p. 582), reports the following case: Patient, age 23, pain in head for twenty days, tinnitus, vomiting. The head was held inclined forward on account of the occipital pain. The vision and the external appearance of the eyes were normal, but a bilateral papillitis was found ophthalmoscopically. Antiluetic treatment was unavailing. On the forty-fourth day in the hospital he suddenly lost consciousness and died. In the angle formed by the lateral olivary prominence and the middle cerebral peduncle an almost round body was found, which turned out to be a cysticercus. The points of interest are:

1. Position of the head, double optic neuritis, vomiting, cardiac phenomena due to compression of the glossopharyngeal and pneumogastric nerves, and finally death by paralysis of the respiratory centers.
2. The histologic structure of the cysticercus.
3. The preolivary site of the cysticercus and the double papillitis.
4. The rarity of the case. C. L.

Syphilis and Ocular Traumatisms.

Antonelli, Paris (Syphilis et traumatisme oculaires, *Archives d'Ophtalmologie*, 1910, Vol. XXX, p. 561), discusses the syphilitic manifestations evoked by a trauma, especially those due to occupation accidents. He repeats Petit's conclusions, the general sense of which is that a wound in a syphilitic pursues an atypical course and may evoke a lesion at the site of the wound or elsewhere, either immediately or even months later. In non-urgent operations it is best to give mercury and iodides for some time previously, and if the operation fails, to give these drugs again and wait six months after the disappearance of the syphilitic lesions before again operating. Antonelli states that while it would be difficult to prove the primary inoculation by the traumatizing body, still a secondary syphilitic infection would be as much the basis for damages as would a secondary streptococcus infection. Showing the dangers of an operation on a patient with unknown syphilis, a case is reported of repeated opening of an abscess of the eyebrow, which finally resulted in a phagedenia. Another case reported is that of an injury to the right eye followed by corneal ulcer, iritis and granuloma of the iris. The patient admitted syphilis, contracted some years before, which had been neglected. Atrophy of the eye and necessity for enucleation was the result. Discussing the question of parenchymatous keratitis caused by ocular injury in a syphilitic patient, he reports three cases. Three conditions must be fulfilled before the diagnosis can be made: (1) The eye must have been healthy before the accident. (2) Direct or well-established indirect trauma of the eye. (3) Keratitis following shortly on the trauma. C. L.

The Indications and the Comparative Value of Perforating Sclerectomy. (a) Without Iridectomy, (b) With Peripheral Iridectomy, (c) With Ordinary Iridectomy.

Lagrange, Bordeaux (Indications et valeur comparée de la sclérectomie perforante, (*a*) sans iridectomie, (*b*) avec iridectomie périphérique, (*c*) avec iridectomie ordinaire, *Archives d'Ophtalmologie,* 1910, Vol. XXX, p. 529), states that the essential idea in this operation for glaucoma is to obtain a fistula with as little interference as possible with the uvea. There are three possible variations of the operation, (*a*) without iridectomy, (*b*) with a peripheral iridectomy, (*c*) with an ordinary iridectomy. Sixty-seven cases are reported as follows:

(*a*) 16 cases, 15 successes, 1 failure.
(*b*) 4 cases, 3 successes, 1 failure.
(*c*) 47 cases, 43 successes, 1 failure. Three other cases, decrease in vision due to a cataract appearing some time after the operation. He finds that cases of glaucoma with a constant hypertension are usually of vascular or vasculo-nervous origin. They are the cases where a sclerecto-iridectomy or a sclerectomy with a peripheral iridectomy should be performed. Cases of glaucoma with intermittent or variable hypertension are suitable for the simple sclerectomy. However, if in these cases the iris prolapses, a peripheral, or an ordinary iridectomy should be added to the simple sclerectomy. The author believes that a sclerectomy with the fistula parallel to the equator is better than the round one formed by trephining, though he does not deny the value of the latter. He believes that sclerectomy with iridectomy is indicated in all cases where the simple iridectomy is indicated, since the addition of the fistula makes the result of the operation more certain. C. L.

Vernal Catarrh.

Trantas, Constantinople (Sur le catarrh printanier, *Archives d'Ophtalmologie,* 1910, Vol. XXX, p. 594), states that this disease is very prevalent in Constantinople and Turkey (185 cases in 25,400 patients). He has already reported upon 117 cases, and now has 68 additional cases. The percentage of affected cases was much greater in his private than in his clinical practice (1.36% to .46%) ; 58 were male patients and 10 were female. The ages ranged from 11 months to 42 years, the greatest number being between 10 and 20 years of age. Most cases were seen in May, June, July and August. Twenty-three patients were affected the first time, and one had suffered for 31 years. There were 12 palpebral, 31 limbus and 22 mixed. The author then takes up the main subject of his paper, which is the frequency and histology of the white spots on the pericorneal margin and the conjunctiva, and the corneal changes following vernal catarrh. Numerous case histories illustrate the points under discussion.

The spots may be white, whitish or yellowish, and were found in 50% of cases. They are most frequent at the supero-external part of the corneal margin, and are present at all stages of the disease. They develop rapidly, last less than a week, and disapear, their places being taken by others. Microscopically they are oblong masses, deeper at their lateral extremities. The inferior surface is distinctly concave, with the concavity turned towards the conjunctiva, which is infiltrated with numerous cells. They enclose a vitreous mass composed of the debris of nuclei. The surface for the most part is covered with degenerating epithelial cells. The corneal lesions may be classed under the following heads: (1) Superficial lesions, shown by fluorescin; (2) Minute lesions of the corneal surface; (3) Parenchymatous plaques in the cornea; (4) Keratitis punctata profunda, and (5) Keratitis sclerosans totalis. They thus vary in severity from the mildest to the most severe type. C. L.

Syphilis and the Keratitis Interstitialis of Infancy.

Beauvieux, Bordeaux (Syphilis et kératite interstitielle de l'enfance, *Archives d'Ophtalmologie*, 1910, Vol. XXX, p. 621), tested 12 cases of interstitial keratitis with the Wasserman reaction and found it positive in 10 cases. He believes that it is always a consequent of an hereditary diathesis and not tubercular. Therefore he urges that mercury be always given.

C. L.

Monolateral Isolated Paralysis of the Motor Oculi of Aneurismal Origin.

Pascheff, C., Sofia (Paralysie isolée monolatérale du moteur oculaire commun d'origine anéurismale, *Archives d'Ophtalmologie*, 1910, Vol. XXX, p. 634), reports four cases by other authors, and one of his own. The lesion always affects the internal carotid between the anterior and posterior communicating arteries. The subjective symptoms are headache and a continual bruit on the side of the aneurism. Objectively there is a more or less complete paralysis of the motor oculi communis. Its evolution is rapid, and the prognosis is fatal, death usually being sudden. C. L.

Diagnosis and Localization of Intraocular Foreign Bodies by Rapid Radiography.

Malot (Diagnostic et localisation des corps étranger intraoculaires par la radiographie rapide, Thèse de Lyon, 1910; abst. *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 132) believes that every case of intraocular foreign body should be radiographed, even when it is visible, as this allows the determination of its position and dimensions. The method is that Nogier, consisting of a occipito-frontal and two lateral pictures, one taken when the patient looks up, and the other when he looks down. The method is to be preferred in diagnosing to the electromagnet and to the sideroscope.

C. L.

Eyeshields of Felt.

Terson, A. (Coques et bandeaux oculaires en feutre, *La Clinique Ophtalmologique,* Vol. XVI, September, 1910, p. 425), at the conclusion of an article enumerating the disadvantages of the eye shields, masks, etc., in use at the present time, recommends that they be made of felt, this being a compromise between the rigid celluloid or metal apparatus and the bandage of soft material. Made of this material, the shields masks, or bandages are very agreeable to the patient, can be used for dry dressing, or, when lined with waterproof tissue, for wet dressing, and can be kept in place either with tape, adhesive plaster, or collodion. M. W. F.

Surgical Treatment of Abducens Paralysis Due to Cranial Trauma.

Terson, A. (Traitement chirurgical d'une paralysie de la 6ème paire due à un trautmatisme cranien, *La Clinique Ophtalmologique,* Vol. XVI, September, 1910, p. 428), relates his experience with 10 cases of this class. Only one of these cases made a complete recovery unaided, and in this case Terson thinks it probable that the cause was an effusion of blood instead of the usual fracture of the ridge of the petrous bone. Most of the cases remain unchanged even after a prolonged medical treatment, an operation being refused by the attending physician. The case described by Terson, however, proves that much may be accomplished by surgical intervention. A woman, aged 45, after being run over by an automobile, showed a paralysis of the left abducens. Convergence was extreme. Five weeks later, as the paralysis seemed stationary, Terson did a free tenotomy of the internal rectus, and after resecting the external rectus, attached the stump close to the cornea. Three threads were used, the upper one being tied first, then the lower one, and, lastly, the middle one. Five days later the eyes were normally placed, and after a fortnight the patient resumed her usual occupation, being able to go about without the slightest trouble. To overcome the small loss of movement to the temporal side the patient turns her head for extreme movements.

Terson does not think that the advancement alone would have been sufficient, owing to the extreme action of the antagonist. He thinks we should be more daring in the surgical treatment of those ocular palsies which have hitherto been regarded as incurable. M. W. F.

Silver Nitrate in Ocular Therapy.

Cassimatis, Alexandria (Sur l'emploi du nitrate d'argent en thérapeutique oculaire, *La Clinique Ophtalmologique,* Vol. XVI, September, 1910, p. 431), believes that in the treatment of conjunctivitis with secretion, especially when the secretion is purulent in character, the old-time nitrate of silver cannot be replaced by any of the numerous silver combinations brought forth in recent years. The organic silver combinations, although much easier of application, are not sufficient to check the purulent secretion. The burning of the nitrate is no serious objection in Egypt, as the patients there rather expect the topical application to cause a certain amount of burning and smarting. After the field has been cleared by the nitrate, protargol and argyrol do good service in completing the cure. The nitrate demands care in its use, as it may increase the inflammation, aggravate corneal ulceration, or turn corneal erosions into corneal ulcers. Whereas Graefe thought the nitrate contraindicated in the presence of fibrinous secretion or anything resembling false membranes, he even went as far as using the mitigated stick in purulent conjunctivitis; modern authors (Morax) think it is never necessary to go beyond a 1/30 solution.

In Egypt, Cassimatis encounters frequently, especially among children ranging from 10 to 12 years, severe cases of purulent conjunctivitis, in which, after the first acute stages have passed, there exists a profuse purulent secretion with marked papillary hypertrophy. The cornea, which seems so vulnerable during the first stages, seems to acquire during the later stages a marked resistance towards the secretion. In these cases the nitrate is of incomparable value, the only drawback being the rapidity with which the tissue accustoms itself to a solution of a given strength, so that progress is soon lost or retrogression shows itself. The solution must be constantly strengthened, and Cassimatis does not hesitate to slowly increase the solution to even 7%. To prevent argyrosis he neutralizes the excess with 5% salt solution and washes freely with a 1/4000 solution of cyanide of mercury. Even children stand these strong applications very well, the thicker the conjunctiva the better. In adults and elderly people, the silver nitrate is sometimes badly borne, and with these the treatment should be begun with strong solutions of argyrol, the weak solutions of the nitrate being brought into play subsequently. As the secretion diminishes, the strength of the nitrate solutions is also diminished, and then finally replaced by other astringents, such as alum, tannin, zinc sulphate, etc.

When the applications of nitrate are carefully made the corneal lesions improve very rapidly. Insufflations of xeroform into the conjunctival sac after the use of the nitrate seem to help very much towards suppressing the secretion. The use of dionin in powder or solution is a material aid in the healing of the corneal lesions.

As a matter of technical detail Cassimatis believes it best for the physician, after cleansing the sac, to evert both lids and hold them firmly with both hands against the orbital margins. A nurse then allows 6 to 10 drops of the solution to fall slowly on the everted mucous surfaces. In cases of profuse purulent secretion in children, of four or five days' standing, Cassimatis does not hesitate to begin with a 5% solution of nitrate, increasing the strength gradually to a 7% solution.

but never beyond that. Instead of increasing the strength of the solution, the same solution can be used several times a day. The ordinary antiseptic washings, of course, are used in the intervals. With these strong solutions one can incite progress in cases which had become stationary under the routine treatment, and cure others which had resisted other forms of treatment. M. W. F.

Collapse of the Sclera in Cataract Operation.

Leroux, Henri, Caen (Apropos d'un cas de collapsus de la sclérotique dans une opération de cataracte, *La Clinique Ophtalmologique*, Vol. XVI, 1910, p. 474), reports a case which, on account of its interest and rarity, deserves a somewhat extended abstract. Most of the better works on ophthalmic surgery contain no mention of this accident. The patient mentioned in this article is the same whose case was reported by the author in the February, 1908, number of the *Clinique Ophtalmologique*, and a brief review of that report will make the present one all the more interesting.

The patient was a servant, 32 years old, whose mother had been blind for two years, but whose father and six brothers and sisters are all well and enjoy good vision. No syphilis or alcoholism. Was rejected from active military service at the age of 20, on account of hypospadiasis, but made no claim of defective vision at that time. Although always a little near-sighted his vision had been good until 1905, when the vision of the right eye began to fail and had disappeared completely at the end of four months. The vision of the left eye began to fail two years later, and in another four months it, too, had disappeared. The patient then consulted Leroux, who found complete cataract in both eyes, the cataracts being of the soft variety, with good pupillary reflexes and projections of light. In view of the bilaterality of the affection and the age of the patient, Leroux suspected diabetes, but the urinalysis failed to reveal sugar or albumin.

May 11, 1907, Leroux performed the operation on the right eye. The corneal incision and the iridectomy presented nothing worthy of note, but when Leroux attempted the discission of the lens the cornea collapsed and a bubble of air entered the anterior chamber. Immediately a striking phenomenon took place: Although no vitreous had been lost the eyeball immediately became soft, the sclera collapsed and folded on itself as though almost the entire contents of the globe had been expelled. The ordinary methods for expression of the lens being out of the question, Leroux brought the lens out with a curette. The lens matter was soft, without nucleus, resembling a traumatic cataract. During this procedure nothing resembling vitreous came away, but the eye continued to collapse. Leroux's anxiety as to the outcome was much relieved when on the third day the eye had resumed its normal volume without the slightest fold of the sclera, the tension had become normal again, and the vision was satisfactory.

Six weeks later the patient had resumed his work and performed it satisfactorily for three years. As the cataract of the left eye caused an annoying diminution of his visual field the patient decided to submit to an operation on the left eye in April, 1910. Again the urinalysis showed the absence of sugar and albumin. Having read of the hypotonia produced by cocain, Leroux instilled two drops only of a 4% solution of cocain, and avoided the use of adrenalin. The march of the operation was an exact repetition of the operation on the right eye. Nothing resembling vitreous was expelled, but the upper lid hung curtain-like in front of the eye, receiving absolutely no support from the globe. Again, on the third day, the globe was found spherical, the wound well healed, and the vision satisfactory. At the time of writing there were no synechiæ, the patient was doing well, the vision on both eyes good, and the patient expected to resume his ordinary work in a few days.

Chodin (case reported at the congress in St. Petersburg in 1903) attributes the accident to a congenital lack of elasticity in the sclera, but Leroux and Sirieys believe that the cause lies in a concentration and retraction of the vitreous, and Sirieys attributes this to the action of cocain, "which by its vaso-constrictive action produces a dehydration which is especially marked in old and decrepit subjects, with sclerosed and rigid tissues, whose essentially senile and over-ripe cataracts have matured very slowly."

Leroux, in rejecting Sirieys' explanation, remarks that in his subject the eyes were very large, the corneæ bombé, and the anterior chambers very deep. He thinks there may have existed a disproportion between the anterior and posterior segments of the eyes, and that the unusually large amount of aqueous humor which escaped caused the collapse of the globes. The presence of cataract in both eyes of a man of 32 without diabetes would make one suppose that there was some pathologic condition of the eye membranes which had interfered with the nutrition of the lenses, but ophthalmoscopically nothing could be found, not even the Fuchs' crescent.

L. Dor suggests that the unusually large amount of aqueous which issued was in reality highly fluid vitreous, which would easily explain the phenomena.

(Meller, in his *Ophthalmic Surgery*, edited by Pyle, says, on page 153: "If the vitreous is perfectly fluid, it will ooze steadily from the eye immediately after the incision, without any gaping of the wound. Great loss of fluid is only recognized by collapse of the eyeball. As this precludes regular extraction of the lens, the loop or tenaculum must be resorted to. On the whole, the loss of perfectly fluid vitreous is much better tolerated than the loss of normal vitreous. In a few hours it is replaced by new fluid, which returns the eye to its normal state of tension. As the wound does not gape, it heals smoothly; whereas, in the loss of normal vitreous, the cicatrix remains ectatic for a long time.") M. W. F.

Detachment of the Retina Treated by Simple Sclerectomy.

BETTREMIEUX (La sclerectomie simple dans le décollement de la rétine, *La Clinique Ophtalmologique,* Vol. XVI, August, 1910, p. 371) opens his article by denying Lagrange's assertion that there is minus tension in all eyes affected with detachment, and asserts that at the outset there is normal and even plus tension. The mistake, he believes, is due to the preponderance given to anatomico-pathologic examinations, and neglect of the clinical findings Dransart was the first to call attention to the high tension of the aqueous in the anterior chamber in fresh cases of detachment, and Nicati, in 1889, induced detachment by forcibly injecting fluid into the anterior chamber with a Pravaz syringe, and the same author has seen the detached retina suddenly resume its place after an evacuation of the anterior chamber. Bettremieux thinks that a simple sclerectomy is the best means of reducing the tension of the aqueous, and describes 9 cases treated by this procedure, with 1 failure, 2 improvements, and 6 cures or great improvement.

M. W. F.

The Treatment of Detachment of the Retina with Tuberculin.

Dor, Louis, Lyon (Le traitement du décollement rétinien par la tubérculine, *La Clinique Ophtalmologique*, Vol. XVI, August, 1910, p. 362), was led by Poncet's showing that many conditions which were really tubercular had previously been considered rheumatic, arthritic, etc., to consider the antecedents of some of the subjects of retinal detachment under his care. One of the patients whom he had treated a short time before for detachment had an attack of hemoptysis in Dor's consulting room. In other patients he found stigmata of tuberculosis, and even in those who present no further signs of tuberculosis Dor thinks the detachment may be considered as a local manifestation of the same. Tuberculosis attacks by preference the poorly vascularized parts, such as aponeuroses, cartilage and the serous membranes, and it seems but logical to add to these the vitreous body, the retraction of which gives rise to most of the cases of retinal detachment. Replying to the self-evident objection that detachment takes place as a rule in myopic eyes, Dor replies by pointing out that tuberculosis shows a predilection for those bones which show too rapid growth. In reply to the objection that some cases of detachment are the result of trauma, he again says that trauma is one of the most frequent causes of local tuberculosis. His strongest argument in favor of his theory is *ex juvantibus,* and he adduces the history of five cases which he treated with tuberculin. The first case has already been described in this same journal in March, 1909, and 16 months later showed no evidence of a relapse. She treated herself with injections of tuberculin for four months after leaving Dor's clinic, and then went to Mexico. The second case was that of a street car employee with 10 diopters of myopia, whose vision in the left eye was restricted to perception of light in the outer part of the field in consequence of a large retinal detachment. Vision was restored without restriction of the field of vision, and has remained so after one year. The third case, that of a farmhand with 20 diopters of myopia, was also completely cured, but the patient returned to work too soon, and now has a small detachment in the upper part of the retina.

The fourth case was that of a woman with 3 diopters of hypermetropia, who was treated three years previously for double detachment, and recovered sufficiently in one eye to be able to read again. One year later sudden renewal of the detachment in both eyes, with the appearance of tubercles in the iris. This time tuberculin was used, the iris tubercles disappeared, and both retinæ reattached themselves, with great improvement in the vision. Although the treatment with tuberculin was continued, there were two relapses in the detachment, and over 100 injections of tuberculin were made. For the past four months there is complete reattachment of both retinæ, and with one eye the patient can read and work a little, but the vitreous trouble in the other eye prevents its use. Dor attributes the lack of functional success in this case to the fact that the patient is a subject of hereditary tuberculosis, and that in hereditary tuberculosis tuberculin seems to be less effective.

In the fifth case, a woman of 44, also a subject of hereditary tuberculosis, the effect was nil.

Dor, in addition to the injections of tuberculin, gave his patients twice a week subconjunctival injections of sea water and calcium chlorid. M. W. F.

Abortive Treatment of Syphilis.

Darier, A. (Traitement abortif de la syphilis, *La Clinique Ophtalmologique*, Vol. XVI, October, 1910, p. 487), gives as his conclusions in regard to the treatment instituted by H. Hallopeau:

1. That by an intense local treatment begun 20 days after the primary infection, combined with an equally active general treatment, one is able to cut short, and eradicate, with all probability, the disease; 141 cases bear witness to this, without a single failure.

2. To effect this it is sufficient to use a daily dose of 0.20 centigrams of hectine, or 0.0025 to 0.0050 decimilligrams of cyanide of mercury, or a combination of these two, called hectarygyre. Since the neutral preparations of hectine have been used the injections are only moderately painful.

3. Treatment should be begun as soon as the diagnosis has

been made with the ultramicroscope, and is still of value if begun even on the twentieth day.

4. It is wise to associate with the local treatment subcutaneous injections of benzoate of mercury and potassium iodide, in order to completely overcome those few spirochetae which may have already emigrated from the initial lesion, and have already been attacked by the drugs absorbed from the local injections.

5. It is well to continue the treatment for 30 days; in one case 20 days were sufficient, and Fouquet had good results with doses half the size and much less frequent, so that, in time, one may hope to do with 15 days.

6 Instead of both drugs the combination of both, Mouneyrat's hectargyre, containing 0.10 centigram of hectine, and 0.002 milligram of cyanide of mercury, is to be preferred, thus reducing the amount of hectine introduced into the organism.

7. After this treatment further treatment is unnecessary, as the disease has been exterminated.

8. The same treatment used on a place that is suspected of having been infected by contact acts as a preventive.

9. Unlike the former systemic treatment this mode of Fredrick treatment permits the local opposition of many thousand times the usual amount of the specific agent to the invading infection, and thus prevents the spread of the infection throughout the system.

10. It makes it possible to eradicate any syphilitic infection if the treatment is begun within 20 days after infection, providing the chancre is accessible for injections, which is not the case if the chancre is situated in the mouth, the vagina, or the rectum.

11. The social progress promised is great, inasmuch as the moment this procedure becomes well known, cases of syphilitic infection will rapidly diminish in number until syphilis becomes a pathologic rarity, as was the case with lepra, which was the scourge of our country for ages. M. W. F.

Serum Therapy of Ocular Infections.

Alexandroff, Ajaccio (Sérotherapie des infections oculaires, *La Clinique Ophtalmologique*, Vol. XVI, October, 1910, p. 483), relates the result in four cases which he was able to follow to the final result. Roux's antidiphtheritic serum was used hypodermically, four injections of 10 ccm each being the greatest quantity used in any one case. No accident occurred, the results were always favorable, in one case even "miraculous."

Case 1.—Serpiginous ulcer, hypopyon. Consequent to an attack of dental neuralgia there was redness and pain in the eye, which she treated with "woman's milk" until the pain grew intolerable. She was then treated by Alexandroff with galvanocautery on three occasions, but the ulcer and the hypopyon kept increasing. Perforation seemed imminent, and Alexandroff proposed resorting to the Saemisch incision, but the patient objected. Although he believed the eye lost he gave the patient an injection of serum, and he was surprised two days later to learn that the patient had been able to sleep, and found that the greater part of the hypopyon had been absorbed, and that the cornea had taken on a far healthier look. Two further injections were sufficient to cure the eye, and two years later the eye is normal both in appearance and vision, with the exception of a slight macula.

Case 2.—Infectious conjunctivitis in a child 18 months old. The child's eyes had been red for several days when they were treated with "woman's milk." The condition became alarming: marked edema of upper lid and conjunctiva, scanty secretion, the conjunctiva covered with adherent gray false membranes; the corneal surface dull, the cornea surrounded by a gray ridge. An injection of serum was made at once, and the local condition treated with lemon juice. The next day there was marked improvement, and after three more injections the child was pronounced cured, 17 days having elapsed since beginning the treatment. A year later both corneae were clear, but there was entropion of the upper lid of the right eye, the eye which had been most affected, due to the destruction of the tarsus. The patient bore no other symptom at the time to guide one, nor was there any diphtheria in the village whence he came, and there had been none for a long time.

Case 3.—A man of 65, very robust, who had been a subject of malaria, was operated for cataract, the operation proceeding without accident. During the night following the operation sweating was so profuse that bandages and bed linen had to be changed several times. Quinine injections. It was not a matter of surprise that the wound showed infection on the third day. The wound was reopened, the anterior chamber lavaged, and the actual cautery applied. Three injections of serum brought the wound back to normal condition, and the patient left the hospital on the 20th day with qualitative vision. A year later there was a leucoma in the lower part of the cornea, but the cornea was clear in the upper half, and in spite of exudates and numerous synechiae the vision was satisfactory, with a certainty of improvement by a secondary operation.

Case 4.—As a result of an explosion a piece of rock was imbedded in the cornea of a man aged 50, and around it was a fairly large gray ulcer. Violent pain and hypopyon. Extraction of the foreign body and galvanocautery of the wound. The following day, before the first injection of serum, the cornea seemed to be melting away, and there seemed very little hope, but three injections saved the eye. Two months later there was leucoma adherens in the upper outer quadrant, but the lower inner quadrant of the cornea was clear, and the patient could distinguish the outlines of large objects. Alexandroff hopes that an iridectomy will bring the vision up.

Alexandroff practiced the injections in about ten other cases, which he was not able to follow up, and states that, even though the injections do not give miraculous results in all cases, he has never seen any harm come from them.

M. W. F.

SOCIETY PROCEEDINGS.

BY

T. B. HOLLOWAY, M. D.,

PHILADELPHIA.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting October 20, 1910. Dr. William Zentmayer, Chairman, presiding.

A Case of Syphilitic Iritis (Iritis Papulosa) Treated with a Single Injection of Ehrlich's "606."

Drs. G. E. de Schweinitz and E. A. Shumway recorded the case history of a patient from Dr. de Schweinitz's wards in the Philadelphia General Hospital who had been admitted on September 17 for the treatment of specific iritis, the initial infection having occurred in August of the same year. The patient had had no constitutional treatment prior to the development of the iritis, and after its appearance only six inunctions of mercury, and less than sixty grains of iodide of potassium. The lesions consisted of a marked thickening of the upper and outer quadrant of the iris beneath which a yellowish papular mass developed, the point of which protruded on the margin of the iris. Down and in there had been an attachment of the iris which had broken loose. Upon the posterior surface of the cornea were numerous precipitates. A single injection of preparation "606" was given, with the kind assistance of Dr. Funk, on October 10. A Wassermann test made five days previously by Dr. Laird was most actively positive. Marked pain and discomfort followed for about fourteen hours, after which there was no disquietude of any kind. Although there had been improvement in the eye prior to the use of the injection, the rapidity with which the lesions disappeared after its use was most striking. Improvement was noted in forty-eight hours, and by the end of ten days the eye was not far from normal. A Wassermann reaction made nine days after the injection was medium positive.

Dr. Holloway stated that he had seen the patient under discussion prior to the injection, and had again seen him yesterday, at which time the iris was practically flat and the eye quiet, and he regarded the prompt and decided improvement as most unusual. The tendency of the profession to look for ill effects following the use of this preparation was doubtless influenced by the unfortunate results that had followed the use of atoxyl in some cases. Owing to this, clinicians have insisted upon an ophthalmological examination prior to its employment. He called attention to the recent series of cases reported by Spiethoff, where, in some cases transitory blindness and scotoma had followed the injections. Acting upon the suggestion of Murphy as recently expressed in the *Journal of the American Medical Association*, he had employed sodium cacodylate in a case of uveitis. This patient had a transitory glycosuria, but no other symptoms of a diabetes; had given a mild Wassermann reaction, and despite the most vigorous treatment the condition had gradually progressed. The patient had now been on sodium cacodylate for a period of two weeks without the slightest evidence of any improvement. In this case the drug was given by the mouth.

Dr. Hansell thought that the profession, if one might judge from the reports in the medical journals, was most enthusiastic concerning the value of "606" in the treatment of syphilis. Rapid cures of inflammation of the various parts of the eye had been described. His experience was limited to a single case of iridocyclitis. Recovery was not particularly prompt or startling, at least not more so than he had often seen following the administration of older and more familiar remedies. The patient was now in the eye ward of the Jefferson Hospital. Wassermann's reaction was positive. He received an injection in the back given by Dr. Olsho, and no other general medication. After one week the symptoms of iritis had improved and the ciliary injection was not as marked. The synechiæ were unchanged. If "606" will destroy the spirochetæ, and mercury and iodides cause the absorption of the exudates, it would seem that a combination would be more effective than either alone.

Double Optic Atrophy.

Dr. J. B. Turner exhibited a case of double optic atrophy caused by an attack of acute fulminating retrobulbar neuritis, in June, 1906. The history of this case was reported by Dr. C. A. Veasey at the October meeting of 1906 and published in the December number of the *Ophthalmic Record* for the same year. The vision of the right eye is now 1/200, while with a 1.75 S. before the left eye the vision equals 6/12. At the present time the patient cannot accurately discern colors, but there is no central scotoma. Dr. Turner stated that the cause of the neuritis in this patient was still in doubt, but thought some auto-intoxication product might be the etiological factor in cases of this type.

Symmetrical Tumors of the Eyelids Allied to Dermoids.

Dr. Sidney Olsho (by invitation) stated the history of a child, aged four years, who had been brought to the Jefferson Hospital, in the service of Dr. Hansell, in February, 1910. At this time there existed in each uper lid a rounded, rather yielding tumor, about the size of a large pea, situated just above the posterior border of the tarsal cartilages at the junction of the inner and middle thirds. The overlying skin was movable and not discolored. The tumors were first noted two and one-half or three months before the child was brought to the clinic; their growth was slow and painless. During their removal by Dr. Hansell the cysts were ruptured, with the evacuation of a thick white sebaceous matter. The examination of this material showed nothing suggestive of the dermoid character of the cysts.

The sections of the cyst wall presented an innermost layer composed of tissue resembling skin; an intermediate portion consisting of lobule-like structures, and an outermost portion consisting of a connective-tissue capsule. The innermost layer was composed of squamous epithelium, six to fifteen cells in depth. The outermost of these squamous cells adjoined the connective tissue which separated this layer from the lobule-like structures. The lobules were of an irregularly oval shape, about the size of a liver lobule, but varied considerably in size. One of the typical lobules showed three zones of cells. The outer one was composed of very tall epithelial cells almost columnar in type, with oval nuclei. The next zone was more loosely arranged, the cells more cuboidal, some having round and others oval nuclei. Many of these cells contained two nuclei. The center of the lobule was occupied by very large, poorly staining granular cells having a more or less spindle-shaped nucleus generally placed to one side. In the sections stained with the Mallory stain these large central cells reacted very strongly to the red dye. A very delicate reticulum of fibrous connective tissue seemed to surround each of these large cells.

Most of the lobules were surroundd by a thin interlobular connective tissue which contained some long spindle cells having oval nuclei. This interlobular tissue was deficient at places, and here more or less blending of the lobules occurred. In certain areas the typical lobular arrangement was not present. Here the large central cells seemed to be continuous with the innermost squamous cells. In a number of sections pigment was seen which was both intra- and extracellular. This pigment was present in quantities about some of the large cells with peripherally placed nuclei, and was constantly extracellular to these. The capsule of the cyst was composed of fibrous connective tissue and showed quite a degree of hemorrhage.

Dr. Hansell thought that Dr. Olsho's paper was a clear exposition, in a comparatively brief space, of the etiology, microscopic anatomy, and clinical signs of dermoid tumors of the lids, but he had not made clear to him the distinction between dermoid tumors and tumors "allied to dermoids," and he would thank him for an explanation.

Dr. Olsho said he had hesitated to say positively that the cysts were dermoids. Although the lining cells were of the squamous epithelial type, resembling very closely those found in the epidermis, the structures immediately below were not typical of those generally found in the skin. The lobule-like structures and their large, somewhat granular central cells, had not been identified with certainty by any of the pathologists who were kind enough to examine the sections with him.

Nearly all the cells were very much of the embryonic type. Senn differentiates this class of tumors into those which developed from a matrix derived from the epiblast before differentiation has advanced to the formation of the appendages of the skin and those derived from such a matrix after differentiation has occurred. In Dr. Olsho's opinion the cysts in question would come under the former variety. He had been reticent about making a positive diagnosis until more of the members of this section had an opportunity to express their opinions of the unusual structure of these cysts.

Spontaneous Rupture of a Glaucomatous Eyeball.

Burton Chance reported a case of spontaneous rupture of a glaucomatous eyeball. The patient, aged eighty-four years, was the mother of a colleague. Symptoms presumed to have been those of glaucoma had existed for two years, attacking the left eye and then the right. Each eye presented the signs of inflammatory glaucoma. The left cornea had become ulcerated and was densely leukomatous. Light perception was not present in either eye. Operative measures were withheld for various reasons. After a year, in March, 1903, an erosion of the right cornea occurred, and later an abscess developed which pointed in the anterior chamber. Enucleation was advised, but was objected to. Paracentesis, with extraction of the slough, was then performed, and healing of the cornea promptly followed. A month later, on bending over while preparing for bed, the lady was seized with violent pain in her head and suffered great agitation. In a few moments the pain was relieved by the bursting of the right globe, accompanied by profuse hemorrhage. The contents of the globe and a large blood clot extruded through a rent in the center of the cornea and were found between the lids. A month later entreaty was made to take out the shrinking mass of ocular tissue. Enucleation was performed under general anesthesia, the socket healed readily, and the patient was free from pain. She died about eighteen months later, having retained her intellectual and vital powers to a remarkable degree up to within a few days before her death. Chance's belief in this case was that the bursting of an ocular vessel caused the rupture of the globe.

Experimental Iris Tuberculosis.

Drs. G. E. de Schweinitz and (by invitation) Gordon J. Saxon exhibited the sections of a rabbit's eye into the anterior chamber of which small portions of tissue taken from the lower lid of a boy, aged ten years, who had been demonstrated before the section in March, 1910, as a case of tuberculosis of the conjunctiva, had been implanted. On the twenty-ninth day after implantation of this granulation tissue tubercles began to appear in the iris tissue, and at this time the animal was exhibited to the section, when eight or ten of such tubercles were evident. Microscopic examination revealed two distinctly tuberculous areas, namely, at the corneoscleral junction externally, and at the pupillary margin of the iris, in addition to which there were diffuse areas of lymphoid cell infiltration. At the pupillary margin of the iris a mass was found which had undergone caseous degeneration and which consisted of caseous granular material containing a few lymphoid cells, some cellular remains of the original tissue, and numerous tubercle bacilli. The area at the corneoscleral junction contained small masses of caseation, and the original tissues were densely infiltrated with small lymphoid and endothelial cells. In this area numerous bacilli were present.

Dr. Hansell stated that tuberculous disease of the palpebral conjunctiva was not easy of diagnosis. Bacteriological examination was usually negative and inoculation furnished the strongest evidence. In this connection he related a recent experience. A young man applied to him for relief from a condition of the lid denominated by him as ptosis. After two or three hours' work the lid drooped over the ball and could not be raised by the power of the levator. Having a dangerously small knowledge of ophthalmology, he contended that the only cure was a plastic operation. Upon everting the lid Dr. Hansell noticed eight to ten small round ulcers surrounded by crescentic whitish rings in the inflamed and edematous palpebral conjunctiva, the like of which he had never seen. Granular, follicular, Parinaud's, and vernal conjunctivitis were dismissed from consideration, and the only other possibility was tuberculous ulceration. Dr. Rosenberg, of the Jefferson Medical College laboratories, examined the secretion and reported negatively. The patient then admitted that he had consulted another ophthalmic surgeon, who promised to cure by operation and proceeded to puncture the conjunctiva with the electric needle!

Cyst of the Corneoscleral Junction Communicating with the Vitreous.

Dr. G. E. de Schweinitz and Dr. G. S. Crampton reported the case history of an Italian laborer, aged nineteen years, as follows: At five years of age a small white granule was first noticed on the conjunctiva just above the corneal limbus, but it had been impossible to ascertain whether this was congenital or not. History of injury was not elicited. This growth remained unchanged until about a year and a half before the patient came under observation, when it grew larger, and four months before its removal increased rather rapidly in size. It consisted of a small, sessile, cystic, irregularly pigmented growth, 4 by 7 mm. in size, protruding 2.5 mm. from the upper portion of the right eyeball, near the limbus, and slightly overhanging the cornea. Ophthalmoscopic examination was negative. The late Dr. Harlan removed the growth, and it was found that it contained a bead of vitreous which protruded from a circular hole 4 mm. in diameter, looking exactly as if the sclera had been cleanly punched behind the limbus. Two years later there was no return and no discomfort. A microscopic examination of the excised tissues proved that it consisted of practically normal conjunctiva, with a small amount of uveal pigment, the conjunctiva having been a covering to the protruding bead of vitreous.

Stereoscopic Photography with a Single Camera; Pupillary Reflex.

Dr. Walter G. Elmer, in presenting a number of very beautiful stereoscopic photographs taken with a single camera, stated that several interesting questions had arisen in his mind in reference to the optics and physiology of the subject.

Dr. Elmer believed that if we were to look at a far distant point in one of the pictures and then at an object close at hand, that the pupil would contract in response to this apparent change of distance, for there must occur a convergence of the visual axes in order to merge the two images, and if this occurred there would be in turn a contraction of the iris.

He stated that the method for taking these pictures was quite simple. After carefully centering the object, the first exposure was made; the camera was then moved three inches to one side, two and one-half inches if the object was very near, the camera again carefully centered on the object, and the second picture taken. He thought this a much better procedure than the old method with the axes parallel, as it corresponded to the manner in which the visual axes of the eyes converged.

Dr. Holloway felt that the section was indebted to Dr. Elmer for presenting his interesting observations, and heartily congratulated him on the beauty of his photographs. Dr. Holloway stated that Dr. Elmer had spoken to him about a week or so ago in reference to the possibility of a pupillary contraction occurring under the conditions just cited. On this occasion Dr. Holloway had stated that while he had never studied the pupils under these conditions, and had never seen any reference to it in the literature, he could conceive of such a reaction occurring under a strong psychic influence, but he did not believe that such would be the case. Dr. Holloway had secured one of the ordinary stereoscopic pictures and had attempted to observe the pupils of but three persons. He stated that under the conditions the ocular phenomena were by no means easily studied, but that in one instance he thought that there had been a slight contraction of the pupil, better expressed as a hippus, or possibly an adaptation of the pupil. In the other two observations no such changes could be definitely noted. He also observed that when attempts were made to change from the distant to the near objects, if one eye moved slightly outward its fellow turned slightly inward, seeming to show a condition of parallelism rather than convergence of the visual axes. As the result of this he still doubted the development of a pupillary contraction, but he thought it would be interesting to pursue a course of study along these lines, under proper conditions.

Dr. Krauss asked how the camera was arranged on a tripod in such a way that the second view could be obtained three inches removed from the first position.

Dr. Elmer, in closing, stated that from his studies he felt that a contraction of the iris must occur, although it was probably slight and very rapid and difficult to detect. To illustrate his contention he called attention to a photograph well adapted for the test and demonstrated that when the eyes were directed toward the more distant of two objects in the picture, the nearer one appeared as two. In nature these two objects had been three feet and one and a half feet respectively, from the camera. He felt that this was further shown by using as a fixed point an object that occupied the same position in the two pictures, and measuring from this to the same objects as they appeared in the two photographs. In this particular case he had found a difference of 5/16 of an inch, which he thought had to be made up by the eyes, inasmuch as the photographs and the prisms in the stereoscope were fixed.

In reply to Dr. Krauss he stated that he had clamped to his tripod a cigar box lid that he had ruled with lines two and a half inches apart.

Marginal Degeneration of the Cornea.

Dr. Zentmayer presented a case of marginal degeneration of the cornea. The patient was a woman, aged forty-eight years, in good health, with florid complexion and no evidences of presinility, and complained of symptoms of conjunctival irritation. There was no history of previous inflammation of the eyes. In each eye there was a well-marked groove encircling the margin of the cornea except for an arc of about 15 degrees down and in. It lay peripheral to the arcus, which was not uniformly dense, and was, in places, encroached upon by the furrow. At the upper limbus the conjunctiva was drawn over the margin of the cornea and was very slightly vascular. At several places along the margin a small point of conjunctiva was drawn over on to the cornea, and at several sites there were pin-point yellowish dots, probably small areas of hyaline degeneration. The surface of the furrow was everywhere reflecting, and there was no staining by fluorescin. There were no degenerative changes in the fundus. H. = 5. D.

The groove was not quite so pronounced in the left eye.

Dr. Zentmayer referred to Seefelder's statement that in all the cases studied anatomically the important changes have been a local degeneration of the corneal tissue, with an effort to compensate for the loss of corneal substance by the formation of fibrillar tissue rich in nuclei and blood vessels. As this is only partially successful, there results in the diseased area a thinning of the cornea, which manifests itself clinically at first in the formation of a furrow which may later result in an ectasia. Fat globules are found in the corneal lamellæ in the vicinity of the furrow. The process is closely allied and associated with arcus senilus.

T. B. Holloway,
Clerk,

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of October 17, 1910. Dr. W. A. Fisher, President, in the chair.

Injury to Eye by Buckshot.

Dr. George F. Suker reported the case history of a young man who in 1903 was shot in the right eye with buckshot. Several shot passed through the nasal wall, entering the left orbit, scraping the upper portion of the globe and causing partial detachment of the retina. Sight was fairly good for about five years, when it began to fail, gradually getting worse and worse. A skiagram was made and showed that a shot was pressing on the optic nerve. The disk was partially choked in the upper quadrant from the pressure. A Krönlein operation being possible, the shot was extracted. At that time objects could be distinguished at about three feet. Four weeks afterward vision was 20/100 and has remained so.

Optic Neuritis Treated by Tuberculin.

Dr. W. E. Gamble reported the case history of a physician suffering from an optic neuritis, in which excellent results were obtained after the injection of tuberculin.

Discussion.—Dr. L. E. Schwarz had a case similar to Dr. Gamble's, due to grippe. He had one hundred and five fits, extending over a period of eight or nine years. During that time the field for form perception never suffered material damage, whereas the fields for colors decreased and increased and then settled down to about the size they were when at their best. He did not suffer a marked contraction of the color fields except for red. Vision was 20/20 throughout. There was a marked optic atrophy.

Dr. E. K. Findley saw this case in the early stage, but the fact that vision was markedly reduced made the prognosis unfavorable. Under mercury the patient grew worse. Tuberculin seemed a last resort, and it was rather surprising to note the amount of vision the patient now has in the presence of such marked atrophy.

A Case of Sudden Blindness with Obscure Etiology.

Dr. H. B. Young, of Burlington, Iowa, reported the history of a patient under observation for eight years. At first the right eye had very poor vision—20/130. There was a considerable deposit on the posterior lens capsule. Vision in the right eye was 20/30 plus, with a small amount of astigmatism against the rule. The left eye remained unchanged; the right eye steadily grew worse. In July, 1910, vision in the left eye suddenly failed. It was 20/100 plus. The pulse was slow; blood pressure slightly below normal. When stepping on a chair or stepladder the patient had a sense of falling backward. The nervous reflexes showed no special changes. He had no headache. In the left eye the disk was pale and blurred. Since July he has taken increasing doses of iodides, without any effect. The tension of the globe is the same today as it was in July. He did not think that it was a case of atrophy, because, if so, there would have been a steady decline.

Discussion.—Dr. Henry Gradle said that he could not see any change in the optic disk, and that the slight blurring seemed to be due to other reasons—haze in the vitreous, or on the posterior surface of the lens.

Dr. Oscar Dodd was not at all sure as to whether the nerve head should appear as it did. The pupil was not dilated and therefore the fundus could not be examined thoroughly. He had seen these cases with fine dots on the posterior surface of the lens, which had remained nearly stationary for a long period, and then showed a degeneration of the retina, much as this case did, but the change was a gradual one and not a sudden one, as in this case. He agreed with Dr. Gradle that the blurring and appearance of the disk was due to the reasons here given.

Unusual Magnet Cases.

Dr. W. A. Fisher reported the case histories of three patients. The first patient, nine years ago, had a piece of iron fly into his right eye. Attempts were made to remove the iron by operation, but failed. Three years ago glasses were successfully prescribed for headache. Recently the eye became irritated, and presented the picture of beginning iritis. A foreign body could easily be seen in the anterior chamber, the end sticking into the iris. The lens was absent, the capsule only remaining. Tension was normal. The next morning the piece of iron was easily removed with the giant magnet. It was more than one-quarter inch in length. Vision is 20/20.

The second patient was struck in the eye by a piece of metal passing through the lower lid into the conjunctiva. A probe could be passed through the opening to the eyeball. An opening was made above and to the temporal side and with great difficulty a piece of iron, 5 mm. long, 3 mm. wide, and 1½ mm. thick, weighing 2 grains, was removed.

The third patient had a piece of metal enter the eye through the cornea, passing through the iris into the posterior chamber, where it could be seen lying on the retina. The lens was not injured. The foreign body was too large to admit of its being drawn into the anterior chamber without injuring the lens; therefore, it was removed through the sclera, first making a conjunctival opening. Three weeks after the operation the vision was 20/30. This case is unusual in that the foreign body was removed through the sclera.

Anatomically Misplaced Puncta.

Dr. Clark W. Hawley reported the history of a man, seen five years ago, who complained of epiphora which evidently had troubled him all his life. When he attempted to probe the passages and pull down the lower lid, he noticed the punctum pointing upward from the upper surface of the lid edge. There was an absence of the punctum on the papilla. The other eye presented the same appearance. There was no eversion of the lid margin and otherwise it was normal in every way. The punctum was about 2 mm. from the edge of the lid and led directly into the canaliculus. After instilling cocain a few times, he inserted a knife into the punctum for a short distance, then turned it backward toward the eyeball as far as possible, and made a slit just sufficiently long to extend down the inner surface of the lid about two or three millimeters, the direction being at an angle to the margin of the lid, backward toward the inner canthus. The patient recovered completely.

A second patient, aged sixty, presented the same condition, except that the puncta were situated back a little from the edge of the lid, not quite so far as in the first case. The same operation was performed, with the same good result.

The third patient, a middle-aged woman, presented the punctum on the upper surface of the lid on the left side only.

In the fourth case the puncta opened directly upward. The same operation proved to be sufficient to give relief.

The last case was one of absence of a punctum, the canaliculus being present. A punctum was made successfully, the same course being pursued as in the cases of misplaced punctum. This patient, too, recovered.

Discussion.—Dr. Oscar Dodd saw one of these cases which had been exhibited before the Society. He personally had one case of congenital absence of the punctum, but in this case he could not find a canaliculus.

Method of Decolorizing the Conjunctiva in Argyrosis.

Dr. L. E. Schwarz employs a method which consists of injection into the conjunctiva of potassium iodide in saturated, half saturated, or 30 per cent solutions, the strength depending on the reaction following each treatment. With the smallest needle of an ordinary hypodermic syringe and a broadsided forceps, a puncture of some portion of the stained area is made and the needle is passed superficially 8 mm. or more into the substance of the conjunctiva, care being taken to keep parallel to and as near the surface as possible. Three or four minims of the solution are injected very slowly. If the discolored area is extensive and the reaction is slight, the injection may be repeated at a point as far removed as possible from the first. When all irritation has subsided, which usually requires from two to three weeks, the injection may be repeated at other points, until the stained area has been well traversed. The effect of the potassium iodide as far as decolorization is concerned is progressive and slow, but certain, producing an almost normal color in the conjunctiva. He has used this method since 1905, with unvaryingly good results.

Discussion.—Dr. L. M. Grosvenor saw some of Dr. Schwarz's patients and on inquiry learned that they were using a 5 or 10 per cent solution of argyrol or protargol at home for some inflammatory condition. They kept the solution on hand and instilled it from time to time, as they deemed necessary. The result was the argyrosis. Patients should be warned not to use such solutions indiscriminately.

In a case of dacryocystitis occurring in an old lady he injected argyrol into the puncta and canaliculi. Some of the solution trickled down through the nose, and there soon followed a little bulging of the lower lid. Five days later she returned with an inflammation. An argyrosis followed. He warned against the too free use of these solutions in lacrimal troubles, because of the tendency of the fluid to extravasate.

Dr. Thomas Faith referred to a report made by a French author some years ago on the use of a solution for the cure of incipient cataract. He tried it in several cases, but the patients complained of much pain. In some a severe chemosis occurred, which remained for ten or twelve days. He attempted to make the injection subconjunctivally, but pain resulted nevertheless. Then he used some soluble iodine solution. supposed to be non-irritating, but the result was no better than from the use of the iodide of potash, except that there was no pain.

Dr. Willis O. Nance said he had seen many cases of argyrosis. In one case the stain was caused by the use of nitrate of silver drops prescribed for home use by a foreign physician. There was an area comprising fully four-fifths of the palpebral conjunctiva, of a dark blue or blackish hue. He thought Dr. Schwarz's method practicable, but failed to see how it was possible to inject the solution into the stroma.

Dr. Harry Woodruff stated that there are some rules which should be followed in these cases, and one is never to use any preparation of silver in the eye for more than thirty days. That is about as long as the tissues will stand it without becoming discolored, that is, a 10 per cent solution. Another rule is never to use any preparation of silver as an injection into the lacrimal sac, because one never knows when the canaliculus may be punctured at some point and a serious condition is sure to follow.

Dr. Major Worthington inquired whether Dr. Schwarz had used this method in cases of stains about the eyeball. He had an unfortunate experience in injecting a very weak solution of argyrol in a case that had been probed and where he thought he had passed the probe into the nose. Subsequently he found that there was a false passage. A marked stain was produced. Although it is gradually fading now, after two years, there is still some discoloration.

Dr. W. A. Fisher said that if he had to choose between injecting argyrol and protargol into the lacrimal sac and removing the sac, he would favor removing the sac, despite the fact that the injection method is apparently a very simple one.

Dr. Robert von der Heydt did not think it so simple to successfully remove the sac, and prefers to inject it for a period, and as argyrosis is really a very rare complication and due to forced hypodermic-like methods, why deprive patients of a treatment which is effective? After irrigating the sac with boric acid solution, instill a drop of argyrol or protargol solution. In a second it is regurgitated at the top punctum. The tissues are thereby reached by the silver solution in a manner in no other way possible.

Dr. L. E. Schwarz said that there is more or less pain and the more perfectly the procedure is carried out, the greater the pain. That is why one should not attempt to do too much. It is difficult to keep close to the surface in the case of a mucous membrane as thin as the conjunctiva, yet the results justify the procedure. Only three minims are injected, as a rule, even allowing for the small size of the drop coming from a small needle. The injected fluid seems to penetrate the tissues. That is why no pressure is made at the time the needle is withdrawn. There frequently is some reaction in the way of swelling, but never amounting to very much.

As to Dr. Nance's remarks, the reason he laid such emphasis on the fact that he did not want it understood to be a subconjunctival injection is because of the usual definition placed on such injection. It means the needle going down into the deeper tissues, whereas he keeps the needle as close to the surface as possible. He has not had a case of argyrosis of the conjunctiva of the bulb, and thought it would be rather difficult to make an injection in such a case because of its extreme thinness. Results can be obtained with greater readiness and ease in the case of integumental staining, because the needle can be inserted easily into the proper place.

Hypertrophy of Tarsus.

Dr. C. J. Swan reported the case history of a patient whose past medical history was negative. The only possible manifestation of inflammation was an occasional edema about the lid. The change in the tarsus was first noticed about two years ago. Since then it has gradually increased in size, most of the hypertrophy being on the skin surface, so that it was impossible to turn the lid. There is no irritation or reaction of any kind.

Discussion.—Dr. O. Tydings had a case somewhat similar to this. There was a decided thickening, more so than in Dr. Swan's case, although not so much broadened out. It had been treated for some time as a trachoma. It had existed for about three years. There was no involvement of the other eye. He used tuberculin and got a response. The patient improved under tuberculin injections, but finally disappeared from observation, so that no report can be made on the further progress of the case.

Pulsating Exophthalmos.

Dr. Francis Lane reported the case history of a patient who was struck on the head with a brick, about three months ago, the result being a fractured nose. After about twelve days there was marked ectropion of the lower lids. The lids were so chemotic that nothing except the conjunctiva was exposed in the lower lid The upper lids were edematous and chemotic. Both corneae were exposed. Cultures and smears were negative, except for diplococci, Gram-negative, and the xerosis bacillus. The lids were so very edematous that it was necessary to do a canthotomy. The conjunctiva was scarified vigorously. Vision at the time of entrance was about 8/200 in both eyes, but improved gradually. After about ten days it was 20/50 in the left eye, and 20/100 plus in the right eye. Potassium iodide was given. After another ten days vision in the left eye was about 20/30. Right eye 20/50. By oblique illumination the iris in the right eye was seen to be muddy. The patient developed an iritis. In the right eye there was enormous dilatation of the retinal veins and many small hemorrhages around the disk. The patient had the three cardinal symptoms of pulsating exophthalmos, the pulsation, the bruit and the exophthalmos. The patient described the bruit as a blowing sound in the left ear. The condition was bilateral, which could be accounted for anatomically, he thought, because of the connection between the right and left sides of the cavernous sinus. Nasal examination and the skiagram were negative. The bruit was readily heard objectively. To-day vision in the right eye is 20/20, and the eye can be compressed without producing pain. Pulsation was continuous over the left temporal region, rather accentuated during systole. The only treatment given aside from the local treatment, was potassium iodide.

WILLIS O. NANCE, Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of October 15, 1910. Dr. E. F. Conant, presiding.

Neuro-Retinitis of Obscure Origin.

Dr. D. H. Coover presented a well nourished boy of 16 years, weight 120 pounds, who had noticed haziness of vision in the left eye for three weeks. R. V. = 5/5. L. V. = 5/60. There was a central scotoma in the left field of vision, and the red and green fields were contracted. He complained neither of headache nor any disturbance except that of the sight. There had been injuries to the head and nose in the past. There were no evidences of accessory sinus disease or syphilis. The urine showed an absence of albumin, but double the normal amount of urates. A marked neuroretinitis, with retinal hemorrhages and exudate, was shown ophthalmoscopically in the left eye, while the right retina presented a watered silk appearance.

A later report from Dr. Coover indicated a clearing of vision under the administration of salicylic acid, and that the blood pressure was 108 mm.

Discussion.--Dr. Jackson noted that the right disk was red and the fundus muddy, and considered that the prognosis was poor.

Dr. Libby suggested a study of the blood, with special reference to pressure.

Intraocular Hemorrhage.

Dr. Coover also showed a man of 66 years, who had been found unconscious in the bath room. The attending physician diagnosed cerebral hemorrhage, although there was no paralysis. On regaining consciousness three weeks later the mental condition was good, but the vitreous was full of blood and debris, and R. V. = 1/160, L. V. = 1-200. Dr. Coover thought the hemorrhage was possibly subhyaloid, and that it had occurred at the time of the loss of consciousness. Vision was variable, but not improving, and the patient was now failing mentally.

Obstruction of Central Artery of Retina.

Dr. Libby presented a man of 21, a restaurant employé, who had consulted him on September 2, 1910, because his right eye had watered and ached for the past five months, while working under an arc light. In May an optician had given glasses which helped the left eye, but not the right. The patient stated that two and a half years before, following free drinking of beer and moderate use of spirits, he noticed loss of sight in the right eye; and believed there had been no change of vision since. Examination showed quantitative vision in the right eye, 4/6 partly in the left. The right disk was very pale, its margins obscured; the macula showed as a cherry red spot, and was surrounded by an area of edema the size of the disk, or slightly larger; and the vitreous showed clouding, with some small floating opacities. The media of the left eye were clear and the fundus normal, although the temporal margin of the disk was pale.

On October 15th the ophthalmoscopic picture had changed materially. The perimacular edema had given place to chorioretinal atrophy, with fine dots of pigmentation; the cherry red spot had disappeared; the vitreous opacities were more numerous and larger and the disk atrophic. The physical appearance of the patient was that of a poorly nourished individual who needed sunshine, fresh air, good food, and sleep, in great abundance. Disregarding advice to consult a competent internist, he put himself under the care of the restaurant physician who "found both sugar and albumin in the urine, which cleared up under buchu, etc., diagnosed syphilis from the blood corpuscles, and gave 'mixed treatment' with good results."

Discussion.—Dr. Jackson thought that possibly vision had been lost from some cause two and a half years before, while obstruction of the central artery had occurred recently.

Degeneration of the Iris in Locomotor Ataxia.

Dr. Jackson presented a patient, a man aged 61, who had suffered for four years with locomotor ataxia. The disturbance of locomotion had come on rapidly; but later he had recovered ability to walk with a cane. About four months ago the sight rapidly failed, the vision of O. D. being 4/15, of O. S., counting fingers at two feet. This was due to optic atrophy. There was miosis, the pupils being 1.5 mm in diameter and quite devoid of light reflex. Under cocain and euphthalmin they dilated to 4.5 mm. The iris presented a uniform pale grayish blue tint, like a wash of color, and was deficient in crypts and other characteristics of iris structure, which had been described as an atrophy of the iris. This appearance seemed due partly to the tension on the iris, for it more closely resembled the appearance of the normal iris when the pupil was dilated. It seemed partly due, however, to a change in the anterior endothelial layer of the iris, which more completely covered the stroma, and presented a rather fluffy appearance when magnified.

Pemphigus.

Dr. Bane reported that the case of monocular pemphigus which he had presented several times before this Society, still remained cured, two years after the successful use of X-rays. A year ago corneal ulcers, which were relieved by argyrol, developed in the other eye, and subsequently pemphigus of this eye appeared on the nasal half of the palpebral conjunctiva, cicatricial changes producing entropion.

Iridocyclitis.

Dr. C. E. Walker presented a man who had recently suffered from gumma of the iris, which developed one year after the primary lesion. The gumma was located on the anterior surface of the iris, below. It had absorbed in three weeks, under mercurial inunctions. There were now posterior synechia and a few deposits on Descemet's membrane, below, but the eye was quiet.

Phthisis Bulbi with Hyphema.

Dr. W. A. Sedwick showed a man of 61, whom he had treated four months before on account of a large scleral wound, loss of vitreous and profuse ocular bleeding. The nasal bridge and upper orbital margin suffered a compound comminuted fracture. This was followed by a huge abscess of the face, which healed under surgical treatment, and the fractured bones united. The scleral wound healed, but cataract developed, vision was lost, and a soft, shrunken, unsightly globe remained. Five days before presenting the case before the Society, a hemorrhage 2 mm. deep had occurred in the anterior chamber, which the patient attributed to a fly getting into the eye. The blood had not absorbed to any appreciable extent. Dr. Sedwick raised the question of removal of this eye, as the patient was unwilling to have it done without further counsel.

Discussion.—Drs. Coover and Libby advised removal of the eye, which seemed to be the consensus of opinion.

Penetrating Wound of Cornea and Lens.

Dr. D. A. Strickler presented a child whose eye had been injured by a splinter of wood passing through the center of the cornea and entering the lens. Clouding of the lens occurred, but partial clearing had resulted in 20/50 vision. Dr. Strickler asked for an expression of opinion as to the advisability of operating in the hope of improving vision.

Discussion.—Dr. Jackson had seen two cases in which an opacity of the lens had cleared; one from a knife needle, the other from a steel particle. He had also seen large opacities clear, only to reappear later on.

Dr. Sedwick recalled a case in which general clouding due to traumatism had cleared except at the center of the lens.

Drs. Ringle and Spencer did not deem it advisable to operate on this eye.

Result of Extensive Wound of Ciliary Region.

Dr. Strickler re-exhibited the little boy shown at the February meeting on account of a knife blade injury received January 7, 1910. The eye was still quiet, the tension normal, and vision equaled the counting of fingers.

Ectropion from Burn.

Dr. Conant showed a young man with a recent severe burn on both lower lids from hot solder, with resulting and steadily increasing ectropion from the contracting scar tissue. An operation would be performed when the eversion became fixed.

George F. Libby, Secretary.

OPHTHALMIC SECTION.

ST. LOUIS MEDICAL SOCIETY.

Meeting of October 5, 1910. Dr. F. L. Henderson, presiding.

Intraocular Cysticercus, with Presentation of a Specimen and a Case.

Dr. Carl Barck: During my practice of over 25 years, I have seen two cases of intraocular cysticercus.

The first one came under my observation about 25 years ago. When seen in 1889 the entozoon was already free in the vitreous. The media were still fairly transparent and the movements of the scolex were plainly visible. It was located very far back, close to the posterior pole. At that time I had constructed an ophthalmoscope to be used as a head mirror, with the view to operate under illumination of the fundus. But I found this method to be absolutely impractical, as others have experienced before and after. I then attempted to remove the cysticercus after the generally accepted method of Albrecht (the younger) Graefe, i. e., through a scleral section. The effort was unsuccessful. The case then took the usual course: increase of cloudiness of the vitreous, chronic iridocyclitis and shrinking of the eyeball. It was more than a year later when the patient consented to the enucleation.

The specimen which I am passing around has been hardened in Mueller's fluid. It shows the vesicle in the vitreous. The scolex is not visible in the section. The size of the vesicle is 3 by 4 mm.

The other case was first seen during my absence by Dr. Clarence Loeb. The patient stated that he had been struck in the eye with a baseball early in June. The eye was swollen and discolored for 11 or 12 days. On about the 21st of July he noticed that he could not see well with the left eye, in the lower outer portion of the field. He consulted Dr. Loeb on the 25th of July and the diagnosis of detachment of the retina was made. The patient was put on the usual treatment and kept at the hospital for about three weeks; then he was treated in his home. The central vision was always normal. Under the treatment a temporary improvement took place, so that the scotoma had nearly disappeared.

When I saw the patient on the 3d of September, the fundus was normal with the exception of the superior nasal quadrant; here the retina was somewhat discolored and it seemed as if a rent had taken place. No detachment was visible at this time. The area of discoloration was located about midway between the horizontal and the vertical meridian and anterior to the equator. Vision = 6/6, Snellen I. The outlines of the fields of vision, as you will see from the chart, were normal; but in the outer lower quadrant there was an area about three times the disk-size, where the vision was not as distinct as in the remainder of the field. This area is indicated by the shaded portion on the chart. But the perception in this portion improved until the 21st of September. On this day the patient returned with the statement that his sight had become worse.

On examination a round bladder-like detachment of the retina could be seen at the old site, from which a green-blue trunk projected. A provisional diagnosis of intraocular cysticercus was made. After repeated examinations the diagnosis became certain. The head and the neck of the scolex could be clearly distinguished; furthermore, movements could be seen at times. Within the following week the scolex seemed to grow, and at the end of this period it appeared to be about twice as long and somewhat thicker than when first seen.

On the 1st of October, some projection was noticed, which looked like a second scolex. It was situated somewhat below and more peripherally than the first one. During the last days the two heads could be distinctly seen by myself as well as by a number of colleagues. The new one appeared to be about half as large as the old one.

For operative purposes I tried to make an exact localization. As is well known, Graefe had an instrument constructed, more than 30 years ago, which he called a localization-ophthalmoscope. It consisted of a small perimetric arc, attached to an ophthalmoscope, which could be rotated. As this instrument proved impractical, Graefe soon abandoned it. A much better method is to locate by means of the perimeter, providing the central vision is still good enough to permit the patient to fix. If the affected area is not too far distant from the macula lutea, the patient fixes the center of the perimeter, whilst the examiner finds with the ophthalmoscope the position which brings the affected area of the fundus into his line of vision, and then reads on the perimeter the meridian and the degree of this position. But if the affected area is near the equator or in front of it, the examiner has to assume an awkward position; then it is advisable to let the patient fix an eccentric spot on the perimeter instead of the center. In my case I brought the cysticercus straight into the line of vision, when the arc of the perimeter occupied the meridian 45°, the patient fixed a mark on it at 40° above, and the position of my eye was at 60° below. The difference of 100° gave the position of the lesion somewhat (10 degrees) anterior to the equator in the mentioned meridian. Repeated examinations gave the same result. The field of vision, taken a few days ago, shows a contraction of the outer and lower portion, the details of which you see on the chart.

The first cysticercus in the eye was observed by Soemmering in 1830. Its seat was in the anterior chamber. The first case with the seat in the vitreous was seen by Coccius in 1853 not long after the invention of the ophthalmoscope. The location in the vitreous chamber is much more frequent than in the anterior chamber. Up to 1900 there appeared 36 communications on cysticercus in the anterior against 194 in the vitreous chamber. Of these 230 reports, 9 only came from the United States; one giving the location of the entozoon in the former, the other eight in the latter. This shows the scarcity of this disease in our country. The region, where the disease is most frequently encountered, is a portion of northern Germany, which embraces the cities of Berlin and Halle. A. v. Graefe and Hirschberg in Berlin, and Alfred Graefe in Halle, saw, during a certain period, up to a half dozen cases a year; the statistics of their immense material gave quite uniformly the ratio of 1 to 1,000 cases. But in the last twenty-five years the frequency of the disease has rapidly decreased, especially in Berlin; later statistics by Hirschberg give the ratio as 1:23000. This favorable result is one of the achievements of preventive medicine; it was partly due to the rigid meat inspection and partly to the enlightening of the public by the profession as to the danger of consuming raw meat. Next to northern Germany, France and Italy are the countries most infested; in England, Holland, Austria, southern Germany and Russia, the affection is rare. Isolated cases have been reported from every part of the globe.

The natural history of the cysticercus is, in many points, not fully clear. The supposition is, that if the egg of the taenia solium comes into the stomach, the gastric juice dissolves its envelope and the embryo becomes free. It then pierces the walls of the stomach, finds its way into one of the blood vessels and is deposited in different organs, amongst them the eye. In the minority of cases only, was the carrier of a cysticercus the host of a tape worm; we must therefore admit the possibility, that the eggs of the taenia reach the stomach directly, being introduced with the food. After the embryo has nested somewhere, it grows and forms at first a minute vesicle, or bladder, not larger than the head of a pin; this increases in size and later on, the so-called scolex develops from some part of the wall. This is at first invaginated and afterwards becomes evaginated. The scolex then projects like a trunk; it consists of a neck and a thickened head. Around the head there are four suckers and inside of these a circle of hooklets, which later are visible under magnification only. The vesicle is semi-transparent and it shows iridescent colors, especially around its edges and in the scolex. When alive, movements and peristaltic contractions take place more or less frequently. The average size of a developed cysticercus ranges from 6 to 10 mm.; the largest one on record was observed by Hirschberg; it measured 15 mm.

The cysticercus is the larva of the taenia solium and is found in pork; the echinococcus is the larva echinococcus and infests beef. But, whilst echinococci are found quite frequently in the different organs of the human body, there are only two indubitable cases of echinococcus in the vitreous chamber on record. Greef and Parsons agree on this point.

Colored pictures of intraocular cysticercus are only given in the earlier atlases of ophthalmoscopy. The oldest one is in Jaeger's Atlas; a case of subretinal cysticercus. In Liebreich we find two pictures; the most conspicuous of these has been extensively copied in the different textbooks. The atlases of Moeller, Haab and Frost do not contain any. The latest original picture is published in the new Graefe-Saemisch.

The intraocular cysticercus is, as a rule, solitary. There are about half a dozen cases on record, where the eye contained two, and in one instane three of the parasites. In some of them the primary nest may have been mistaken for a second individual. But Graefe found two cysticerci in an enucleated eye, and Cohn, after removal of an eye, from which he had extracted one previously, found that it contained a second one. It is therefore possible that there are two parasites in the eye of our patient, and I welcome your opinion on this point after your examination.

The nest of the entozoon is at first subretinal; after it has reached a certain size, it pierces and leaves the retina through a rent and is finally found free in the vitreous. These three stages of development, subretinal, in the vitreous, but still adherent to the wall and freely moving in the vitreous, are also quite important for practical purposes and determine the method and the prognosis of our operative procedure.

This brings us to the treatment, which I mention only briefly to-day. At first the different anthelmintica were tried without result. The older Graefe initiated operative procedures. He conceived at one time the idea which has been revived of late, to destroy the parasite by injections or by instruments. But the deliberation, that even the dead animal might exert a detrimental influence upon the eye, caused him to abandon the attempt. Then he resorted to extraction, and was successful in some instances. His method was extraction through the pupillary area, after a preliminary iridectomy and removal of the lens. For the classical method, which is now generally accepted, we are indebted to Alfred Graefe. Briefly speaking, this is the scleral section. After a careful localization of the cysticercus a triangular flap of the conjunctiva is dissected back with or without detaching the tendon of one of the recti muscles. Then the sclera and chorioid are incised and the parasite is removed. On the detail of this procedure and the results I will dwell when reporting the outcome of this case. I would have operated sooner, but on account of the infrequency of this affection in our country, I wanted to present it to this society. During the few days of delay the condition has not changed, and I shall operate in the near future.

Discussion.—Dr. Clarence Loeb had not heard the earlier part of Dr. Barck's paper, and hoped he would be pardoned if he repeated what Dr. Barck had said. He had seen the case first on the 26th of June. The patient stated that for a week he had noticed a shadow on the right side. At that time he gave no history of trauma. Later he mentioned that fact. There was no pain and no injection. When the vision was taken the first time, there was almost total loss of the lower right quadrant. He was sent to the hospital and put on eliminatives. At that time there was detachment of the retina. On the 3rd of August there was no trace of the detachment of the retina and the visual field was almost completely normal, though there was slight contraction in the lower quadrant. On the 12th of August he left the hospital but on the 16th he returned to the office, saying that the eye was as bad as it had ever been. There was slight contraction of the field of vision but ophthalmoscopically the picture was about what it is at the present time, i. e., it looked as though a vesicle had ruptured leaving the remains of the sac. He was again put to bed with the administration of dionin locally and potassium iodide internally, but it seemed to have no effect. Around the area of the ruptured vesicle the retina seemed slightly detached. On the 30th Dr. Barck had returned and the patient was then turned over to him, and Dr. Loeb had thought no more of it until Dr. Barck had told him his diagnosis. He had been looking over the literature and in contradiction to what Dr. Barck had said as to the unusual number of cases in Berlin, he had noticed one article in the *Zeitschrift für Augenheilkunde*, 1908, in which more cases were reported from Russia and Italy. One author reported five cases in Italy and there were two reported in Russia in the same year. Another article reported a case of cysticercus treated by incision into the sclera, the positive electrode was introduced and the cysticercus was destroyed. Another article reported good results from the intraocular injection of a weak bichloride solution. There was almost immediate restoration of vision. One author had stated that cysticercus acted as an aseptic foreign body, causing detachment of the retina and thus producing loss of sight of the eye.

Dr. Meyer Wiener, referring to the fact that Dr. Barck had said that this condition was very frequent in Berlin, said that he had been told by one of the physicians in the largest clinic in Berlin that he had never seen a case.

Dr. Julius Gross asked Dr. Barck if he would not try some other method before enucleating the eye?

Dr. Frank Henderson asked Dr. Loeb how he explained the disappearance of the retinal detachment and then its reappearance.

Dr. Loeb thought that there had been a subretinal serous effusion and that the cysticercus was too small for him to see it. Later it grew larger and became visible.

Dr. Barck wanted to add a few words to what Dr. Loeb had already said. He thought that there might have been some serous exudate, which caused a large detachment of the retina. He believed, that at the time the vesicle was very small, then rupture took place and a portion of the retina became reattached. As to the size, the vesicle was about as large as the optic disk.

He gave it as his impression that there was a second parasite in the eye smaller than the first one seen.

As to the cause of the infrequency of cysticercus in our country, this is without doubt due to the fact, that the habit of consuming raw meat is quite unusual in the United States. In Germany not only cases of cysticercus, but of echinococcus as well, have diminished enormously in frequency, since the public has been enlightened on the danger of raw or insufficiently cooked meat.

Dr. Luedde asked Dr. Barck if there was anything in the history of the man to which he could attach any explanation of this condition. He would like to know something more of the proposed plan of operation, and what size he expected the cysticercus to be when he cut into the sclera.

Dr. Shahan said with regard to non-operative measures that a case history had been reported by Dianoux in the early part of the year in *La Clinique Ophtalmologique*, in which a man of 31 years, affected by a tape worm, and with cysticercus of the skin, of the eye (in the vitreous) and of the nervous system (as shown by epileptiform crises) was treated for two months—with frequent intermissions—with extract of male fern. The final result reported was the death and absorption of the cysticercus in the vitreous and cessation of the other symptoms. Similar results had been reported by Prof. Renzi of Naples.

A second case history was reported to the *Société D'Ophtal-*

mologie de Paris by Dupuy-Dutemps last March, in which the patient had a subretinal cysticercus in the region of the macula. Operation was attempted after failure following the use of male fern. The first operative attempt was a failure. Two months later a second attempt was made. This time the cysticercus, which measured about 4x6 mm., popped out suddenly without rupture of the vesicle, and the eye made an uneventful recovery with vision of about 1/50.

Dr. John Green, Jr., said that he would like to have Dr. Barck in closing dwell a little on the operative procedure he proposed to resort to.

Dr. Barck did not know whether any of these procedures should be recommended. The method of getting rid of a cyst by the use of injections of iodine had, as a general rule, been abandoned. Most of these cysts were now removed by operation and he was not sure but that an operation was safer than the injection of any of these substances in the vitreous. But even supposing that one could kill the cysticercus by the injection, there would still remain a foreign substance in the eye, the effect of which was unknown. The results of the removal were quite good, about 60 to 70 per cent being successful in cases where the cysticercus was not free in the vitreous. Those which were subretinal and those adherent to the walls gave a better prognosis than those free in the vitreous. Those operated upon by the old method of A. von Graefe were not as satisfactory as the ones operated on by the scleral method, introduced by his nephew, Alfred Graefe. The procedure was to remove a triangular flap of the conjunctiva, so that the sclera was perfectly bare and then to rotate the eye as far as possible in the opposite direction. When the cysticercus was located very far posteriorly, it was necessary to sever one of the muscles in order to rotate the eye far enough. When subretinal, the cysticercus simply came out through the section without much manipulation. In these instances the section leaves the retina intact. In cases where the parasite had penetrated through the retina and was in the vitreous, there was necessarily more or less loss of vitreous. For extraction different instruments, as hooks, forceps, spoons, etc., had been used. When the cysticercus was free and movable, it was of course a fishing in the dark, and the prognosis was far less favorable.

Enucleation was only indicated where the case was seen, after the eye had become blind, or where the operator had failed to extract the parasite. He would like to have the opinion of the Society, as to whether any one recommended attempts to destroy the parasite by injections or galvano-puncture, before operating with the knife. These methods did not appeal to him for the reason that a foreign substance would be left in the eye.

Dr. Henderson asked if there were any reported cases of sympathetic ophthalmia resulting from the uveitis produced by the cysticercus.

Dr. Barck said that there were such cases reported, but only where operations had been performed.

The LaGrange Operation: Report of a Case.

Dr. N. M. Semple: The question of the relative value of the operative and the medicinal treatment of chronic non-inflammatory glaucoma is always an interesting one. I reported to the Ophthalmic Section of the American Medical Association (meeting of 1908, Chicago), the case-history of a patient who had then been under observation for over five years. On one eye an iridectomy had been performed, while the other eye had been under the constant influence of the oil solution of eserine, producing an uninterrupted miosis. Up to the present time (1910) the iridectomized eye has retained the same markedly improved condition which followed the operation, not only in respect to the central visual acuity, but also in the extent of the visual field. In contrast to this, the eye under the miotic has steadily lost, until at present there is practically no vision. In this case there was no demonstrable increase of the intraocular tension.

The case which I report to-night is one of like character, except that there were periods of decided increase in tension (+ 1.), accompanied by a rapid failure of vision. There was no history of any inflammatory attack of any kind. At the time of the first examination, the right eye could count fingers at about ten feet, the left eye at five feet. An accurate determination of the visual fields was not made, as the patient was still in bed recovering from a previous rectal operation. A rough test showed the fields of both eyes markedly contracted on the nasal side, more so in the left eye.

On May 4th a combined iridectomy and sclerotomy was done, following as closely as possible the method suggested by LaGrange. The immediate recovery was normal. On September 2nd, the examination of the operated eye showed the vision to be 20/38 with the following correction, + 1.5 sph. ⊃ + 1.5 cyl. ax. 135°. The vision of the right eye, in which the oil solution of pilocarpin had been faithfully used in sufficient strength to produce perfect miosis, had decreased to the counting of fingers at one foot, while the nasal portion of the field was entirely gone. It is too early to make any claim as to the permanency of the result in the left (iridectomized) eye, but the rapid loss of vision in the right eye, despite the faithful use of a miotic and which had produced perfect miosis, is in most striking contrast to the so far most excellent result obtained in the other eye by the LaGrange operation.

The possible permanency of a filtrating scar seems to be contradicted by the animal experimentations of Henderson, yet I have one case under observation where such a scar has persisted for over seven years—so far as can be positively stated from the clinical observation. From the theoretical anatomical standpoint, I see no reason why the endothelium of Descemet's membrane cannot grow into a scar formation in a manner analogous to the original formation of the ligamentum pectinatum with the spaces of Fontana and the canal of Schlemm.

Discussion.—Dr. Meyer Wiener said that it might be interesting to report to the members, that the LaGrange operation done by Dr. Greenwood at the meeting of the A. M. A. had proved quite a success. This patient had a chronic simple glaucoma. She had been gradually, slowly and surely getting worse. Since the operation the fields were slightly larger and the vision had improved somewhat, whereas before the operation it had slowly but surely deteriorated, though eserine had been thoroughly used.

Dr. Green asked Dr. Semple what sort of scissors he used in cutting off the flap. The point which had particularly impressed him in the LaGrange paper was that he recommended a pair of scissors curved like a semi-circle.

Dr. Semple said that he had used the ordinary Stevens' scissors. After making a deep cut with the Graefe knife, bringing it out quite a distance from the corneoscleral margin, with the ordinary curved tenotomy scissors of Stevens, he had cut off a good lip of the sclera. He could see an advantage, but not a necessity, in having the scissors especially curved.

J. F. Shoemaker,
Section Editor.

BOOK REVIEWS.

A Treatise on Diseases of the Eye.

By John E. Weeks, M. D., Professor of Ophthalmology in the University and Bellevue Hospital Medical College, New York. In one octavo volume of 944 pages, with 528 illustrations and 25 full-page plates. Cloth, $6.00, net. Lea & Febiger, Publishers, Philadelphia and New York, 1910.

This elaborate text-book is particularly welcome as coming from one whose wide experience and well earned reputation would seem almost to demand a permanent record of his work thus far in ophthalmology. The author's expressed intention has been to produce a treatise that will enable the undergraduate in medicine to obtain a sufficiently comprehensive and trustworthy knowledge of the subject; a book to which the practitioner of medicine may refer for information regarding questions concerning the eye; and also a book which may be of use to the specialist in ophthalmology. This threefold requirement has been successfully met in the present volume, and a balance maintained which is rather unusual for such an extensive treatise.

The first eighty-seven pages of the book are devoted to the *Embryology and Anatomy of the Eye*, an arrangement which we believe to be better than the scattered consideration of these subjects appropriately placed throughout the text. The third chapter on the *General Principles of Optics* has been written by Dr. William Norwood Souter (formerly Dr. William Norwood Suter), and contains a clear explanation of these principles, without which a proper understanding of many of the problems daily presenting themselves in ophthalmology is well-nigh impossible.

Dr. Weeks, in describing the many diseases and conditions of the eye, has been in most instances brief and clear, and has included the essential points. In some cases he has been too brief, perhaps, and not altogether clear. Pathology forms an important part of his descriptions, and numerous references to the literature are given.

We regret that the author continues the confusion so often noted in the use of the terms *hemeralopia* and *nyctalopia,* and while either day-blindness or night-blindness might be read into either word, unless Greek scholars can agree, it were better to discard both terms and use descriptive English which is certainly clear and to the point. This has been done by the author of a recent American text-book (1910), who says: *Night-blindness* (often incorrectly termed hemeralopia, but properly nyctalopia); *Day-blindness* (often incorrectly termed nyctalopia, but properly named hemeralopia).

The book contains five hundred and twenty-eight engravings and twenty-five full-page plates in colors. They are beautifully executed, and while a great many of them are old friends, and some of them very old friends, they are so nicely made that the reader is glad to see them again. We cannot pass, however, without expressing our unconditional disapproval of a practice in book making which would seem to be too frequently observed, and which is most flagrantly exhibited in this particular book. We refer to the indiscriminate use of illustrations in which the name of the author is ignored, and replaced by the names of others (usually the editors of cyclopedias or systems), who themselves have previously used the plates also without due credit. Thus, as the lawyer would say, the felony is compounded.

It is customary to place the blame for such literary piracy upon the publishers, and they usually accept it with dignity, if not pleasure, but it seems to us that it is a part of the author's duty to protect, in so far as he can, the work of his colleagues.

The last two chapters of the book contain a very useful account of special remedies,—including the use of tuberculin, sera, and vaccines, and the methods of preparing specimens for diagnosis in the search for microorganisms. Finally, there is a descriptive table of some of the culture characteristics of the pathogenic microorganisms of the eye.

Dr. Weeks has given us one of the most complete and comprehensive text-books on the eye yet published, and one which is sure to find general favor among ophthalmologists.

William T. Shoemaker.

The Ophthalmic Year Book, 1910.

The Herrick Book and Stationery Company, Denver, Colo. Price, $3.00.

Volume VII of this valuable publication has been prepared by Doctors Edward Jackson, Theodore B. Schneideman and William Zentmayer. It contains a very complete digest of the literature of ophthalmology, with an index of publications, for the year 1909. The amount of work done in ophthalmology, the creditable additions to the literature and the actual progress made during the included year, are surprising, and it requires but a few hours' devotion to the year book to convince even the most industrious how absolutely impossible it would be to keep abreast of the subject without such a publication.

Dr. Jackson's experience has shown him that certain topics each year have been the subjects of special thought, investigation and study. These, he says, deserve on that account special attention from all ophthalmologists. The number of such topics of current general interest in the present volume is indeed large, and includes: The international standard of visual acuity. Tonometry. Protective glasses. Serum therapy. Ocular lesions of tuberculosis; their diagnosis and treatment by tuberculin. The bacteriology of the conjunctiva and lacrimal sac. The educational movement for the prevention of blindness. The significance of trachoma bodies. Sympathetic inflammation. The cause of glaucoma, and its treatment by various forms of sclerotomy. The pathogenesis of cataract and its extraction in the capsule. Amblyopia from the use of atoxyl and allied drugs.

All of these subects are of great importance, and to have the literature relating to them and other subjects so carefully reviewed and abstracted for us is an indispensable convenience.

The *Biographical Notices* for the year contain an unusual number of names for years well known and deeply respected. Among them are Douglas, Argyll-Robertson, Simeon Snell, R. Marcus Gunn, Ludwig Laquer. Theodore Saemisch, Duke Karl Theodore, and from this country, George C. Harlan and Ferdinand K. Hotz. It would be difficult to enumerate a like number of names better known in ophthalmology.

We regret that Dr. George E. de Schweinitz has found it necessary to withdraw from the joint authorship of the Year Book, but congratulate Dr. Jackson and Dr. Schneideman upon securing a successor so able to continue the work as Dr. Zentmayer.

The present volume contains a number of most excellent illustrations in the text and two beautiful colored plates.

To those who are familiar with the Year Book no recommendation is necessary; to those not familiar we advise an early introduction. William T. Shoemaker.

The Physician's Visiting List for 1911.

P. Blakiston's Son and Company, Philadelphia.

The Physician's Visiting List is now in its sixtieth year of publication, which speaks well for its popularity. It has long been a favorite pocket companion of thousands of physicians, and its publishers have always been most careful to keep the dose table and other tables of useful information up to date in every particular. Several styles are published, ranging in price from $1.25 to $2.25, adapted for recording, 50, 75 or 100 visits per day or week, and still other styles designated as "perpetual edition" and "monthly edition."

The contents of the edition before us which provides for 25 patients per week are: Calendar 1911-1912; a new complete table for calculating the period of utero-gestation; table of signs for use in keeping records; incompatibility; poisoning; the metric or French decimal system of weights and measures; table for converting apothecaries' weights and measures into grams; dose table, English and metric systems, in accordance with the new U. S. P. (1905); asphyxia and apnea; comparison of thermometers.

The *"Visiting List"* is very complete; it contains what is expected in a book of this kind and does *not* contain information that is not wanted. William T. Shoemaker.

NEWS AND NOTES.

In Memoriam.

Dr. Edmund W. Stevens.

The Colorado Ophthalmological Society desires to record its full appreciation of the high character and attainments of one of its charter members, Dr. Edmund W. Stevens, whose death occurred in Denver, October 30, 1910, after a few days' illness.

Dr. Stevens graduated with honors from the Jefferson Medical College in the class of 1884, at the age of twenty-one. He settled in Philadelphia, where his worth won recognition from such men as Weir-Mitchell, Jackson and de Schweinitz.

In 1898 ill health caused him to seek the more favorable climate of Colorado, which undoubtedly prolonged his life. His ability as an ophthalmologist, his broad culture, and his social gifts were recognized by the profession and by the public. Bravely he built up another practice, often struggling against, but never complaining of adverse circumstances. His simplicity of manner, entire frankness, and absolute honesty emphasized his evident ability, in the minds of physicians and patients.

He rendered lasting service to the Colorado Ophthalmological Society, as one of its founders, as its very efficient secretary for two years, and as a constant attendant at its meetings. His discussions were always pertinent, terse, and at times epigrammatic, and were always listened to with marked attention, profit, and pleasure. It is not too much to say that each member of the Society takes Dr. Stevens' death as an individual and personal loss.

This Society feels that, although his medical contributions were highly creditable and valuable, yet Dr. Stevens was even a better ophthalmologist than his writings would show.

For the irreparable loss of the widow and infant son of our beloved colleague, this Society wishes to express to Mrs. Stevens its heartfelt sorrow and most cordial sympathy.

George F. Libby,
Walter Hilliard,
David A. Stricker,
Committee.

Dr. Llewellyn Williamson has given up the practice of ophthalmology and removed from St. Louis.

C. M. Dé, L. M. S., of Agra U. P., India, lecturer on Ophthalmic Surgery, and Ophthalmic Surgeon to the Thomason Hospital Medical School, has joined the staff of the ANNALS.

Drs. W. C. Bane, Melville Black, E. T. Boyd, Edward Jackson, G. F. Libby, W. A. Sedwick, and E. O. Sisson, all of Denver, have taken offices in the Metropolitan Building, a new six-story fireproof structure, which has been built exclusively for the use of physicians and surgeons.

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THE CHEMISTRY OF METABOLISM IN ITS RELATION TO OCULAR DISEASE.*

S. Lewis Ziegler, A. M., M. D.,

Philadelphia.

Metabolism in health and metabolism in disease are two diverse problems which demand our closest study. Both are controlled by that biochemistry which is rapidly becoming the pathology of the future. The vital processes which are constantly occurring in the tissues and fluids of the body are deeply influenced by these chemical changes and by the toxic products that create a perversion of physiologic function. We have long known that bacteria were dangerous and destructive, but it has remained for chemical pathology to show us that the toxins which they engender are even more pathogenic. The influence of these chemical biproducts on the ocular structures is manifested chiefly as a localized hyperleucocytosis, of a toxic character, which falls, therefore, under the generic classification of chemotaxis. As this chemotactic process bears such an important relation to our subject I shall take the liberty of quoting the views of Da Costa[1] on this interesting problem:

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*This paper, in its revised form, represents the substance of two addresses, one before the Albany County Medical Society, November 22, 1910, and the other before the Philadelphia County Medical Society, January 11, 1911.

"The exact manner in which pathologic leucocytosis arises is a question about which many conflicting views are held by different authorities, but the general trend of opinion at the present time attributes the increase chiefly to the influence of chemotaxis. According to the chemotactic theory of leucocytosis, the presence in the blood of certain chemical substances, produced by infective principles, is capable of exerting both an attractive and a repellent influence upon the ameboid leucocytes. If the collection of cells are attracted by such substances, the phenomenon is known as *positive chemotaxis*, but if, on the other hand, they are repelled, the condition is termed *negative chemotaxis*. This massing and repulsion of the leucocytes may be caused by various agents—by thermal and mechanical irritants, by bits of necrotic tissue which have gained entrance to the circulation, and especially by the presence in the blood of bacteria or of their metabolic products."

The perverted metabolism of the system, in so far as the eyes are concerned, is influenced by many complex factors. The endogenous causes are most prominent. Disturbed physiologic function is directly responsible for much of the pathogenesis. Lymphatic stasis, lymphatic insufficiency, and perverted lymphatic secretion are extremely important elements. Suboxidation and changed function due to disturbances of the ductless glands are powerful factors in this problem. Autointoxication arising from indigestion and constipation plays a prominent role. La grippe, the exanthemata, and in fact all febrile disturbances, are accompanied by an overproduction of perverted secretions that may prove chemically irritating to the delicate tissues of the eye, and thus produce optic neuritis or paresis of the extraocular muscles. Diseases of the liver or kidney are especially liable to cause a precipitation of toxins that may prove injurious to the eye. Of a similar character are the perversions arising during pregnancy and the fugacious disturbances of menstruation. Excessive emotional disturbances, such as fear, grief, anger or other unusual excitement, may cause a perversion of metabolism by interfering with the internal secretions and by lowering the systemic oxidation. Post-operative mania is a good example of such a perversion. Similar effects may be produced by sexual excesses, by the nervous strain incident to exhausting mental application, by worry, by severe pain and by shock. High blood pressure often becomes a potent factor in originating localized lesions of the eye.

The ectogenous causes of disturbed metabolism arise chiefly from the ingestion of foods and drugs that are chemically irritating. Certain individuals may exhibit an idiosyncrasy against these, as for example such foods as strawberries, lobsters and mushrooms, or such drugs as atropin, quinin or morphin. Knies[2] believes that a pronounced toxemia may result from ptomains and toxalbumin when shellfish are eaten, even though no evidence of decomposition is present. He asserts that certain of these toxic products of malassimilation have a specific effect upon the eye; muscarin and neurin producing accommodative spasm and myosis, while tyrotoxin causes paralysis of accommodation and mydriasis. Of similar selective character are the toxic amblyopias following the ingestion of lead, quinin, methyl alcohol, tobacco and coffee. When these are taken in small quantities their corrosive action on the neuro-retinal fibers is insidious and partial, but when larger amounts are consumed the destruction may become sudden and complete. While alcoholic excesses have an ectogenous origin, their ultimate manifestations of perverted secretion and subkatabolism chiefly resemble those of endogenous toxins.

In addition to these there are many extraneous physical factors that bear an intimate relation to the etiology of these disturbances: exposure to extremes of heat and cold, high relative humidity, low barometric pressure, persistent east winds, drafts on the body or directly on the eye, deficiency of ozone in the air, inhalation of air containing an excess of carbon dioxide and disturbed electrical conditions, all of which tend to upset the metabolism.

The human organism is, therefore, a vast physico-chemical laboratory in which the most delicate and complex chemical reactions are constantly taking place; and this greater laboratory, as it were, includes many lesser laboratories which though more or less sequestrated and of minor importance, are nevertheless actively at work. The eye is the best organ of the body for the careful study of these manifestations because it is an end-organ, and because its pathologic processes are more open to inspection. All of the ocular structures may be affected by these metabolic disturbances; the uveal tract most frequently, the retina and optic nerve less often, the cornea and sclera infrequently, and the muscular apparatus occasionally.

As we approach the question of what is the chief physiologic factor in perverted metabolism we are constrained to answer, suboxidation. When the oxidizing power of the blood is normal, when the ductless glands are actively furnishing their quota of internal secretion to stimulate this function, when the individual is in full possession of unimpeded respiratory powers, and when the air which he breathes is pure, there is no pabulum on which to breed disease. But when the oxygen intake is limited by respiratory obstruction, when the air is drawn from poorly ventilated rooms, and when the habits are sedentary, then every grain of coffee becomes a drachm of xanthin poison, every ounce of food becomes a pound of toxic proteid and every germ of disease becomes a giant of destruction.

The origin of suboxidation is of so complex a character that it is somewhat difficult to outline its various ramifications. Respiratory obstruction is probably the most important etiologic factor; it matters not whether this lies in enlarged tonsils, in adenoid vegetations, in hypertrophied turbinates or in the intranasal congestions that accompany mouth breathing. They are all foes worthy of our steel. But while we are studying these problems the collateral problems of perverted secretions in the nose and accessory sinuses, of disturbed digestion, and of intestinal toxemia are forced upon us as a part of the pathogenic whole that requires our most careful consideration.

Nothing can illustrate the relation of suboxidation to the perverted metabolism of ocular disease more characteristically than the clinical picture of corneal ulcer in the child, which is familiar to us all. The local ulcer is the smallest part of the symptom-complex. It is the sequel rather than the cause. Aside from the lacrimation, photophobia and blepharospasm there is but little evidence that the eye is involved. On the other hand, the nasal obstruction is pronounced. The secretions exuding from the nose are viscid, acrid and chemically irritating, often hanging down on the lip and causing eczematous excoriation. The nasal mucosa is so sensitive that a slight draft on the body or the raising of an eyelid will cause a reflex fit of sneezing. The general symptoms, moreover, show the most typical effects of lowered oxidation. The skin of the whole body is ashy-pale, relaxed and leaky, being bathed in perspiration, while the hair is matted together by the great excess of moisture transuding from the scalp. In winter the perspiration and body chilling encourage overdressing or "bundling up," which only adds to the extreme sensitiveness already present.

The error of suboxidation in these cases can be best corrected by the restoration of free nasal breathing through local applications to the nose, and the withdrawal from the diet of those articles which demand a large amount of oxygen for their assimilation, such as tea, coffee, cakes and candy, coffee being the worst offender because of its high xanthin content, while the carbohydrates are a close second. When this has been accomplished the ocular lesion will promptly heal without further treatment.

Enlargement of the tonsils has been referred to as a pathogenic factor in suboxidation and its sequelæ. So far as we know the tonsil has but little internal secretion that might become perverted. Occasionally it accepts and transmits some infectious process. As a rule, however, the chief disturbing factor lies in its obstruction to breathing. The exact etiologic relation to the resultant lesion cannot always be explained. I can recall an anomalous case of marked papilledema in a child, that was persistent for over a year. During that period it was examined by many competent surgeons[3]. The condition was suggestive of brain tumor, but there were no focal symptoms. The most careful examination revealed absolutely no systemic lesion except enlarged tonsils. It was difficult to believe that edema of the nervehead could arise from respiratory obstruction. The presence of a certain degree of mental hebetude, however, recalled to my mind a series of mental defectives that were treated by the late Dr. Pepper, who believed that this subnormal mentality was the result of suboxidation, and proved it by having them relieved by tonsillectomy. The tonsils in my case were accordingly removed, following which the mental dullness cleared up and the edema of the optic nervehead promptly subsided. This case fortunately occurred several years ago. Today we would probably plan to relieve such a condition by a decompressive operation.

This observation of tonsillar interference with systemic oxidation was amply confirmed in a study I made last year of "*Symmetrical Lymphomata of the Lacrimal and Salivary Glands,*"[4] otherwise known as Mikulicz's disease. The etiologic question at issue was whether this chronic, non-inflammatory, glandular hypertrophy was incited by suboxidation associated with toxemia, or whether it was the result of a bacterial invasion. I shall quote what I then said in regard to the etiology of this rare condition because it is germane to several phases of our subject:

"The etiologic factors which most writers have recorded in these cases are: 1. Infection from buccal or conjunctival bacteria; 2. glandular irritation from some toxic agent in the blood or lymph stream causing lymphatic hyperplasia; and 3. some idiopathic origin. No specific bacteria have been demonstrated in these cases, the microscope usually revealing lymph cell infiltration of the interstitial tissue, which Mikulicz considers wholly responsible for the enlargement of the gland. Although bacterial infection is usually accompanied by an acute inflammatory process, no inflammation has been noted in these cases. Granting the possibility of infection, whence would it originate—from the eye, the mouth, or the nose? It has been stated that trachoma of the fornix has caused lacrimal adenitis (Baquis).[5] By analogy it is deduced that buccal bacteria might be transmitted through Steno's duct and thus infect the parotid (Hanau)[6]. I think it is much more probable, however, that the source of this invasion is nasal, and the means of transmission through the lymphatic capillaries. It certainly seems possible that a steady stream of toxic, bacteria laden secretions could be absorbed from the accessory sinuses (chiefly antrum) and carried directly to these contiguous glands. If, however, the origin is an infection from neighboring parts, why should the course of this disease be so sluggish and the condition remain unchanged for months and even years? *On the other hand, may this not be a chronic hyperleucocytosis strictly localized to these enlarged lymph glands?*

How can we explain the retrogression of these glandular swellings during the course of an acute intercurrent disease, and their recrudescence in some cases soon after convalescence? Kümmel[7] has reported such an occurrence during pneumonia, Mikulicz[8] during appendicitis, Haeckel[9] through a severe enteritis, Delens[10] after an attack of cholera, Zirm[11] during an attack of erysipelas which followed partial excision of the gland, Quincke[12] from a similar cause, and Osler[13] after an attack of acute pleurisy with effusion. The query naturally arises, *does the general disease create a systemic polymorphonuclear leucocytosis that temporarily overwhelms and obliterates the localized hyperleucocytosis in the affected glands?*

There still remains for our consideration the view that some agent or chemical irritant in the lymph stream might cause an occlusion of the efferent lymph channel of the gland, and thus encourage leucocytic engorgement. This could occur in one of two ways: 1, from some perversion of glandular function resulting in the secretion of irritating materials and their retention within the gland substance, and 2, from irritation of the gland by some toxic fluid which is absorbed and transmitted from neighboring parts. Both of these processes may be properly included under the general term of chemotaxis or toxic leucocytosis.

The first proposition has a typical exemplification in the case McHardy[14] has placed on record, in which sudden enlargement of the lacrimal glands resulted from excessive indulgence in grief. Lagrange[15] has reported a case of temporary enlargement of these glands due to the perverted metabolism of the menstrual period. We also know that the antrum may secrete a fluid so irritating that it will cause swelling of the Schneiderian membrane and excoriation of the nostril and lip.

The second proposition is amply demonstrated, as I have previously intimated, by the fact that the fluid contents of the accessory sinuses (chiefly antrum) may be absorbed by the lymphatic capillaries and carried to these contiguous glands. In confirmation of this view I can recall having seen a case of chronic, indurated lymph node of the cheek that had been diagnosed sarcoma by several competent surgeons. It promptly and spontaneously disappeared after a nasal operation that restored antral drainage and free breathing. Whether this lymphoid hyperplasia was caused by a bacterial infection or by the absorption of an irritating lymph fluid was difficult to determine. That it was not sarcoma was convincingly demonstrated by its rapid and complete resolution."

In the two cases of lymphomata that my study was based upon resolution of the enlarged glands was promptly gained by tonsillar excision without medication, thus removing the respiratory obstruction and improving the systemic oxidation. In a subsequent case, however, great improvement was secured by the exhibition of thyroid extract in small doses. Arsenic, in the form of Fowler's solution, has usually been employed in these cases on account of its well known power of increasing the oxidation of the blood. These therapeutic facts tend, therefore, to confirm the view expressed as to the etiology of this disease.

Our problem, however, is not always solved so simply. I have already referred to the fact that several etiologic factors are frequently commingled and sometimes confused. Sub-oxidation may be supplemented by intestinal toxemia from constipation and digestive disorders, and both complicated by perverted sinus secretions that are at once infectious and toxic. Such a case was kindly referred to me in consultation about two years ago, by Dr. A. J. Bedell, of Albany.

His sight had been failing for about five years. During the preceding two years it had been reduced to 20/70 in the right eye and 20/50 in the left eye. The nervehead was somewhat pale, and the vitreous was made hazy by a cobweb opacity, the result of a former hyalitis. There were several isolated areas of old chorioiditis with pigmented deposits along the course of the vessels. The fields were contracted in both eyes, with central scotomata. He suffered from severe headaches for five years, but these had ceased about two years before. They were followed, however, by sharp attacks of facial neuralgia, chiefly in the spring and fall. He had enormous puffing of the septum and turbinates, causing mouth breathing at night. There was a slight escape of glairy mucopus from the antrum. A microscopic examination of the antral secretion revealed pneumococci in large numbers with a few streptococci. His vision would drop sharply whenever his breathing was obstructed by a cold in the head. The same blurring would occur whenever his bowels became constipated. The vision, however, recovered promptly as soon as these functions were restored to their normal condition. The vacillating vision showed that the infection or toxemia was intermittent and dependent upon the degree of autointoxication and associated suboxidation. It did not, however, clearly demonstrate which factor was most pronounced. In fact, there was a possibility of both elements being active. He had previously been placed under a careful and systematic course of alterative treatment, but the results were disappointing.

The indications were in favor of intranasal cauterization in order to restore the ventilation and drainage of the nose. Following this operation his convalescence was rapid. His distant vision recovered from 20/70 to 20/30, the reading vision improved from J 10 to J 3, and the fields increased greatly on the temporal side.

Autointoxication from the intestinal tract is probably the form of metabolic disturbance that presents the greatest amount of clinical evidence. The subject has been ably discussed within recent years by de Schweinitz[16], who is convinced that uveitis, blepharitis, keratitis and certain neuro-retinal lesions result from the absorption of toxic substances that have been previously eliminated in the waste of the intestinal canal and have there undergone putrefactive decomposition. Woods[17] in a later communication freely endorses these views and cites some interesting cases in confirmation. Turck[18] has demonstrated that intestinal toxins, injected into the dog's circulation, will cause blindness through organic changes in the nervehead.

Unfortunately the urine in these cases of autotoxemia does not always show a relative elimination of tangible toxins, just as there is a lack of such evidence in serious ptomain poisoning. Jaffé,[19] however, is convinced that the degree of bacterial decomposition in the intestines can be measured by the amount of indican found in the urine. Elschnig[20] and Groyer[21] likewise accept the view that the presence of indican in the urine is pathognomonic of intestinal toxemia. De Schweinitz, on the other hand, believes that indican, while not always present, is very suggestive when it does appear. Although this interdependence seems probable, there is no evidence to show whether the indicanuria results from overproduction of intestinal toxins, or whether it is caused by their excessive absorption. On this point Hertz[22] pertinently remarks: "When excess of these substances is present in the urine of constipated individuals, it may just as well be due to the increase in the quantity absorbed, owing to the longer stay of the feces in the colon, as to an increase in the quantity produced." While the presence of indican in the urine is significant of intestinal toxemia it should be remembered that indican is not in itself a toxic substance, but has probably been modified in the process of elimination.

Daland[23] endorses the view that indicanuria is significant of putrefactive absorption but believes that autointoxication may originate in the mouth and nasal sinuses as well as in the intestines, that indicanuria may be present without symptoms of toxemia and that constipation may exist without indicanuria. He further says: "Indicanuria has been observed in diarrhea, in association with indigestion, gastritis, enteritis, colitis, ulceration or obstruction of the small or large intestines, cholera, dysentery, Addison's disease, typhoid fever and inanition. Clinically, indicanuria occurs more readily when the hepatic function is disturbed than when this organ is normal."

Eales[24], of Birmingham, was one of the first to call attention to the fact that prolonged constipation was liable to cause recurrent intraocular hemorrhage. He believed that this was most prevalent in young men at about the age of puberty and was probably due to some unexplained vaso-motor spasm in the splanchnic region, which created a high arterial tension and thus caused a retinal or ciliary hemorrhage. I have treated and reported a number of these cases of hemorrhage from the ciliary body occurring in females[25] and in all of them there was abundant evidence of a toxemia aside from the acknowledged intestinal torpor. The fact that they cleared up under prolonged catharsis would seem to indicate that some irritating chemical was being absorbed from the intestinal tract and carried by the circulation to the minute end-vessels of the eye, where further escape was impossible and a minute rupture of the vascular sheath was the necessary result of the corrosive action and subsequent endarteritis. A similar toxic action from a disturbed renal function may be the origin of the so-called albuminuric retinitis and subretinal hemorrhages which occur in Bright's disease, although the disturbed suprarenal secretion probably participates in this lesion. The perverted metabolism of the menstrual period may also cause an intraocular hemorrhage, which is usually classified under the head of vicarious menstruation. I have observed several cases of this character.

Knies[26] expresses similar views as to the chemopathic origin of retinal hemorrhage in his discussion of Hirschberg's[27] cases. He says, "In very acute sepsis from the absorption of a large amount of the chemical products of decomposition, and toward the end of life, in the more chronic infections, extensive retinal hemorrhages are often found." The sudden hemorrhagic infiltrations occurring as sequelæ of la grippe probably have a similar origin.

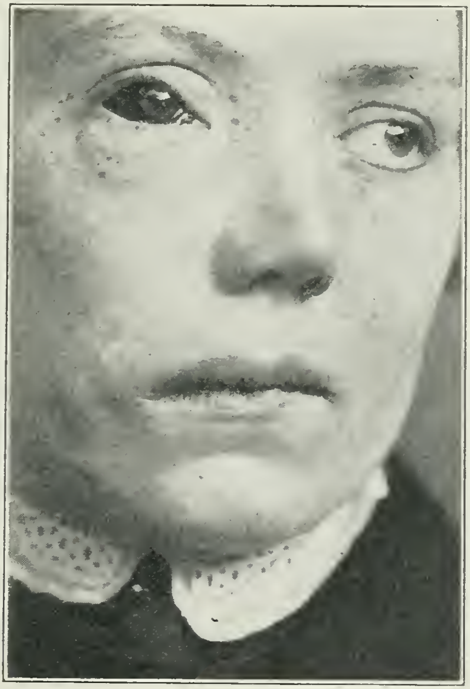

Figure 1. Hemophilic extravasation into conjunctiva and cheek of right side. The facial scar was caused by a previous effort to excise redundant tissue after a similar attack seven years before.

In 1901 I had under my care an unusual case of hemophilic extravasation (Fig. 1) following chronic constipation, in which there occurred a tremendous cellular infiltration of the right cheek, accompanied by a vascular growth that projected from the conjunctiva of the left eye. The condition so nearly resembled sarcoma of the antrum that a general surgeon advised immediate excision of the upper jaw. As I had previously treated her she was again referred to me for further study. I recalled that I had seen her in a similar attack some years before and that her history showed a recurrence of this disturbance every seven years. Prior to this last attack she had suffered severely from hyperidrosis, starchy indigestion and chronic constipation, the stools occurring at intervals of more than a week. The urinary examination was negative. The blood count showed erythrocytes, 4,820,000; leucocytes, 10,400; hemoglobin, 80 per cent. She was placed on thyroid extract and suprarenal extract, with a liberal use of cathartics. There was some improvement but it was slow. As she had marked nasal obstruction, which was increased by the pressure of the extravasation, it was finally decided to cauterize the inferior turbinate and the septal puff. One month later, simultaneous with the opening of the nostril, the resumption of free breathing caused prompt and complete absorption of the hemic infiltrate and, coincidently, the clearing up of a facial acne that had been present for more than a year.

Here again is shown a similarity in the disturbance of metabolism produced by constipation and by nasal obstruction, which can be traced back to the common ground of suboxidation. In other words, if the toxins are properly oxidized they are eliminated as harmless compounds. When they become so excessive that they cannot be oxidized they disturb the metabolism. This was further illustrated by this same patient who noticed that her tendency to hemorrhage from the ocular and buccal mucosa was suddenly increased when she indulged in strawberries or peaches. Another patient in the same class suffered from severe intraocular hemorrhage[28] after eating a box of strawberries. It has been shown that the acid in the strawberry may cause eruptions, hives, whorls, petechiæ, vomiting and attacks of nervousness in patients whose weak metabolic balance predisposes them to such disturbances. The chemical analysis of strawberries shows no especially irritating element, unless silicic acid (6.05 per cent.) may be so considered. It is claimed that silex is a deoxidizing agent and so might have a disturbing action on the oxygen content of the body fluids, somewhat analogous to that of the xanthin compounds and the carbohydrates previously referred to.

The modern view that the internal secretions furnished by the ductless glands are vital to the metabolic processes has been confirmed beyond cavil. A most instructive review of this subject has recently been made by Meltzer.[29] The influence of the thyroid gland on metabolism and particularly on the oxidizing power of the blood is of the highest importance. The action of thyroid extract as an alterative and an absorber of deposits led me many years ago to use it in ocular disease and especially for absorbing subretinal effusions and hemorrhages into the vitreous. It proved to be of marked value in the series of intraocular hemorrhages which I have previously mentioned. Administered in small doses (gr. j-ij, t.i.d.) it has frequently caused the prompt disappearance of a stagnant hemic deposit that had previously resisted a prolonged course of the iodides. Its restraining influence on hemophilic tendencies is well known. I have also found it of great value in reducing high arterial tension. Radcliffe[30] has recently shown the beneficial effects of thyroid extract in modifying the nutrition of the eye in cases of interstitial keratitis, while Risley[31] has confirmed this observation and demonstrated its additional value in the keratomalacia of certain cretinoid types.

As previously mentioned, lymphatic dyscrasiæ are pronounced pathogenic factors in the metabolic problem. Perverted lymphatic secretion is certain to follow the irritation of toxins when the reserve oxygen is low. This condition is particularly noticeable in interstitial keratitis, in serous iritis and in chronic glaucoma, where it often amounts to lymphatic stasis. The source of chemical irritation may occasionally be wholly localized within the eye. I have several times observed cataractous lenses that contained irritating chemicals and have seen these cause glaucomatous attacks and flannel-red eyes whenever a little of the retained lens substance escaped from the collapsed capsular cyst into the anterior chamber.

The query naturally arises, how can we control this condition of lymphatic stasis? In other words, is it possible to inhibit perverted lymphatic secretions and to stimulate fresh ones? I have found that this can undoubtedly be accomplished in the eye by administering hyoscin and morphin hypodermically to inhibit the flow of irritating lymph and by supplementing this with pilocarpin guarded by strychnin to stimulate the secretion of fresh, active lymph. This observation seems to be a contradiction of the well known fact that in glaucoma we should administer eserin to contract the pupil and, *per contra,* that hyoscin is dangerous because it dilates the pupil. This dictum is undoubtedly true when hyoscin is instilled locally, but when administered internally it acts on the whole lymphatic system to inhibit the flow of perverted lymph and to cause its absorption before a mydriatic effect can be exerted upon the eye. Following this, the pilocarpin will stimulate the secretion of fresh lymph and thus relieve the local stasis. As soon as this stasis is removed the eserin already in the eye becomes active and the pupil immediately contracts.

My first experience in the use of this contradictory medication occurred in 1888. A patient suffering from severe glaucoma was suddenly plunged into acute mania. The pupils had remained widely dilated in spite of the prolonged use of a strong solution of eserin. I gave a hypodermic injection of hyoscin hydrobromate to control the maniacal excitement. On examining the eyes an hour later I found that the pupils had yielded to the eserin that had been previously instilled and were absolutely myotic. One week later I administered hyoscin to another case of glaucoma to relieve nocturnal neuralgia with equally good effects. The hyoscin was given internally for several nights with the result that the glaucomatous attack was completely relieved. A recent examination of this patient showed that there had been no return of the disease for more than twenty years. Since that time I have always used this combination to abort attacks of fulminating glaucoma and to control the exacerbations of this disease that are liable to occur.

It is equally valuable as an abortifacient in many similar conditions, and should prove useful in many phases of general disease. It will control post-operative mania if given in the early stages. It should only be used as an emergency remedy and should not be administered as a continuous medication. If the inhibitory effect is most desired the hyoscin and morphin may be given first, followed in a half hour by the pilocarpin and strychnin. If the lymphagogue action is indicated this sequence should be reversed, the pilocarpin and strychnin being given first, and the hyoscin and morphin later. In a few cases I have tried a dosimetric effect by dividing a single dose of the alkaloids into six equal parts and giving one of these portions at more frequent intervals. As a rule, however, I administer the four drugs together, once or twice a day, for two or three days, either by the mouth or hypodermically, in the following dosage:

R.	Hyoscin. hydrobromat.	gr. 1/100
	Morphin. sulphat.	gr. 1/6
	Pilocarpin. nitrat.	gr. 1/8
	Strychnin. nitrat.	gr. 1/30

Similar lymphostatic effects may be secured by the use of any of the solonaceæ or their derivatives. The belladonna preparations are not, however, as efficient as those of hyoscyamus. Passiflora incarnata probably belongs to this group as it possesses a decidedly inhibitory action on perverted secretions. Its efficiency is especially noticeable in the later toxemias of pertussis, the exanthemata, la grippe and alcoholism. Picrotoxin (gr. 1/100) also exerts a somewhat similar effect. It has been used chiefly to check the night sweats of phthisis. I have often given it in ocular disease where a leaky skin denoted the dermic elimination of perverted secretions, the formation of which may often be prevented by its use. Morphin, while possessing a pronounced inhibitory action on secretions, has certain derivatives, such as dionin and apomorphin, that are active lymphagogues, although not so efficient as pilocarpin. The prolonged administration of morphin, like that of alcohol, creates perverted secretions similar to the endogenous toxins, which can only be counteracted by the use of hyoscin and pilocarpin.

The brilliant work of Ehrlich in the field of chemopathology has brought us a step nearer to the goal of chemotherapy. Chemopathy, or the chemical theory of disease, has thereby received an impetus that has focused the attention of medical investigators the world over. If the cultivation of this fascinating field of research shall abolish the present tendency to "medical nihilism" and forever banish that fatal dictum "not to give any drug that might mask the symptoms," a great and humane good will be accomplished and "rational therapeutics" will again assume the important position in medicine that it should naturally command.

Chemotherapy should have at least three objects in view:

(1) sterilization of the body fluids, in order to inhibit bacterial life without danger to the human organism, (2) neutralization of the irritating toxins and perverted secretions already circulating in the system, and (3) stimulation of fresh secretions from the lymphatic and ductless glands. The specific action of Ehrlich's arsenobenzol on the spirocheta of syphilis, seems to partially meet these indications; it acts as a direct lethal poison on the parasite istelf (spirillicide), it produces a radical change in the biochemistry of the body fluids, and in addition to this it seems to exert a pronounced stimulating effect on metabolism and nutrition that cannot be wholly explained through destruction of the spirocheta. In a case of interstitial keratitis (hereditary) recently treated for me through the courtesy of Dr. Judson Daland, the Wasserman reaction was strongly positive (+ 4). An intragluteal injection of gram. 0.5 was followed by slight ocular improvement. As the Wasserman reaction remained uninfluenced at the end of a month a second injection of gram. 0.3 was given intravenously. This was promptly followed by marked improvement. It is probable that this direct method of administration will prove the most efficient, although it will always require a skilled operator to execute the more elaborate technic.

The preparations of arsenic have long held sway as important therapeutic agents in metabolic disorders. Fowler's solution in combination with tincture of chloride of iron and mercuric chloride is an old established reconstructive tonic. Cacodylate of soda (gr. 1/20), digitalin (gr. 1/10) and thyroid extract (gr. ij) is a combination that has proved to be valuable in improving assimilation, and in reducing high blood pressure. Small doses of arsenious acid combined with the glycerophosphates will exert a direct influence on ocular disease through improvement of the general metabolism. Clemens' solution of the arsenite of bromine (m. iij-x) has demonstrated its value in diabetes mellitus. It has been my custom to resort to this chemotherapy in all ocular complications of this disease and to administer it for several weeks prior to any operative procedure. In two recent cases of cataract extraction this treatment had been carried out for about two years, until all diabetic symptoms had disappeared. The operations were wholly free from accident or post-operative reaction.

Donovan's solution of the iodides of arsenic and mercury

(m. v-xxx) is probably the most efficient combination of these drugs that we possess. While its specific action is best exhibited in the secondary and tertiary lesions of syphilis, its value as an alterative and an absorptive of plastic exudates in non-luetic cases is of the highest order. I have sometimes used it hypodermically to secure a prompt and decided action. Lugol's solution seems to exert a specific iodin therapy on the thyroid gland in exophthalmic goitre.

In tertiary lesions the large quantities of potassium iodide that have often been employed are suggestive of a chemical saturation of the body fluids. On the other hand, the lymphagogue action of the mecurials may be manifested when the dosage is extremely minute, the action being exerted directly on the eye as well as on the liver and if carried to excess resulting in stimulation of the salivary glands to the point of salivation. These small doses of calomel will stimulate the liver to destroy the intestinal toxins and thus correct the indicanuria. Phosphate of soda has a similar action on the liver and on the alimentary tract.

The massive doses of the salicylates which Gifford employs in sympathetic ophthalmitis also possess a chemical significance worthy of our closest study. According to the strength of the solution, salicylic acid when applied externally has a mildly corrosive or cleansing effect, as in ichthyosis, or an escharotic effect, as shown in the application of Ewing's solution to neoplastic growths. Whether a similar chemical action is manifested *in vitro*, or whether there is simply a sterilization with neutralization of certain toxic substances in the body fluids remains for the biochemist of the future to determine. The abortive action of salol and phenacetin in the early toxemia of la grippe or the dengue-like symptoms of a cold is probably the result of a similar chemical manifestation.

Although not as well known, the administration of carbolic acid, in what may be considered large doses, has a somewhat similar action to that of salicylic acid and the salicylates, to which it bears a close chemical relation. Contrary to the present belief, its administration will increase the urine and cause it to clear up and become a limpid or straw colored fluid. At the same time it stimulates a rapid improvement in the local lesion and a general physical betterment that is apparent to physician and patient alike. It is only when its poisonous action is pronounced that a smoky urine develops, but this is manifested much more slowly when the body fluids are saturated with the toxic biproducts of perverted metabolism. A trial of this therapy in sympathetic inflammation has met with sufficient success to warrant the placing of other lesions under this therapeutic test. I am convinced that carbolic acid merits our further study from the new standpoint of chemotherapy.

A most instructive case of neuro-retinal edema with temporary blindness, successfully treated by this method, occurred in the practice of Dr. Herbert Fisher[32] of this city, a few years ago. The patient was suffering from post-puerperal nephritis and was apparently moribund from uremic coma when first seen. The urinary examination showed a test tube almost solid with albumen. Carbolic acid was administered, well diluted, every three hours, beginning with one minim in two ounces of water and increasing by one minim at each dose until ten minims of the acid and twenty ounces of water were given at once. This dosage was then continued three times a day for a week, at which time the patient was practically convalescent. In about two weeks she was able to be removed to the mountains where her health and vision were soon recovered and have been satisfactorily maintained for the past four years.

In another case of long continued, low grade septicemia, the result of a prostatic bruise, complicated by a small localized abscess, the same treatment was instituted, the phenol being increased as the patient acquired tolerance until symptoms of dizziness were manifested. The sensation of perineal weight soon disappeared and was followed by a feeling of stimulation and physical wellbeing that continued until complete recovery was assured.

A similar therapy was advocated by the late Dr. D. F. Woods,[33] of this city, about twelve years ago, in a severe case of tetanus with convulsions. He administered thirty minims of a 10 per cent solution of carbolic acid hypodermically every half hour the first day, every two hours the second day and every three hours the third, at which time the spasms began to lessen. The injections were then continued three times a day for about two weeks longer until the muscular rigidity had disappeared. There was profuse secretion of urine in which the odor of phenol was noticeable. Although slight smokiness of the urine made its appearance on the second day, no other toxic symptoms developed. Whether the action of carbolic acid is wholly a sterilizing one, or whether it neutralizes certain toxic substances in the body fluids and ultimately encourages oxidation, are problems that remain to be solved. It should at least be kept in mind as an emergency remedy to be resorted to in desperate cases of local or general toxemia.

Urotropin should also be studied more carefully in its relation to chemotherapy. Crowe[34] has demonstrated its lethal action on B. typhosus and B. pyocyaneus. He has also tested its sterilizing power on the body fluids by withdrawing cerebrospinal fluid through a lumbar puncture and making streptococcus cultures before and after administering the drug. He thus succeeded in reducing the bacteria from 30,000 to 500 (per plate) in the brief period of two hours. He was able to show that its maximum efficiency is exhibited in from one to five hours after its administration, although it continues to circulate in the blood for about twenty-four hours. By delicate chemical tests (Hehner) he revealed its presence in the synovial and cerebrospinal fluids, pleural effusion and blood. He found that it was eliminated in the urine, bile, pancreatic juice and saliva. Although it did not disturb the stomach it sometimes caused hematuria, which promptly disappeared when the drug was withheld. Cushing administers it to prevent infection in all injuries and operations about the head.

Barton[35] has employed urotropin in pneumococcic infection of the middle ear. He not only demonstrated its efficiency as a germicide, but also proved by accurate chemical tests that it was directly eliminated from the auditory canal about twelve hours after its ingestion. I have used urotropin with success to shorten the course of a series of cases of hypopyon keratitis, in doses of from 5 to 10 grains, three times a day. Dinkelspiel[36] has recently reported the successful administration of 40 to 80 grains daily in cases of sympathetic ophthalmitis and iridocyclitis with hypopyon. It is evident that the formalin content of this drug has a more marked sterilizing effect on the body fluids than formalin has when administered alone.

We should not overlook the fact that quinin is a most efficient therapeutic agent both from the standpoint of metabolism and of chemotherapy. It fulfills all the requirements of the latter by being lethal to the plasmodium malaria, by neutralizing certain toxic agents in the blood and lymph stream and by stimulating fresh secretions, probably through its bitter principle. At the Wills Hospital it has long been combined with turpentine in what has been termed *"McClure's Mixture."* I have seen this combination act most efficiently in clearing up the sluggish circulation of chronic iritis and iridochorioiditis, and in relieving at least one notable case of sympathetic ophthalmitis when every other therapy had failed.

While searching for an effective chemotherapy we should not forget that the emunctories must be kept active. Elimination may be encouraged through the kidneys or by diaphoresis through the skin. Vapor baths, alone, were most efficient in bringing relief to a marked case of papilledema from la grippe, while injections of pilocarpin were successful in a case of optic neuritis following measles.

The treatment of gastro-intestinal toxemia requires (1) correction of all dietetic errors, (2) strong digestive principles to fully digest the food and promote its assimilation, (3) intestinal antiseptics to allay fermentation, such as thymol (Henry), resorcin, bismuth salicylate or potassium permanganate, and (4) thorough emptying of the intestines by vegetable and saline cathartics, or by intracolonic lavage.

Hypodermoclysis should be resorted to whenever there is impending danger of post-diphtheritic paralysis, in order to dilute the toxic fluids and thereby weaken their corrosive action. The same principle is involved in the injection of fluids into the sheath of a painful nerve. It is not so much the character or composition of the fluid injected, but the fact that it dilutes the chemically irritating fluid in the nerve sheath and thus relieves the pain.

In conclusion, the chemistry of metabolism demands for its scientific elucidation a skilled biochemist who should have a higher special training even than the bacteriologist. The chemical pathologist must work hand in hand with the internist or much of his effort will be wasted for lack of correlated clinical knowledge. He should have infinite patience in utilizing the minute quantities of secretion that can be secured for his investigations, and must, therefore, be a microchemist. It should be his aim to work out toxin reactions that can be used for local or general tests, just as the bacteriologist has partly succeeded in securing bacterial reactions. When he has reached this point he will be able to furnish us with chemical and antitoxin reagents which will supplement our serums and bacterins and thus provide us with a more rational method of diagnosis and treatment.

In our search for an efficient chemotherapy to restore the balance of metabolism we should always preserve our proper relation to the normal chemistry of the body fluids by utilizing the following physiologic methods:

1. Administer those chemicals which will neutralize the irritating toxins and sterilize the body fluids, thereby inhibiting chemotaxis and preventing bacterial growth.
2. Increase the systemic oxidation by removing all respiratory obstruction and improving the nasal ventilation and sinus drainage.
3. Inhibit perverted lymphatic secretions by the proper therapy.
4. Stimulate fresh lymphatic secretions by the use of lymphagogues.
5. Administer glandular extracts when the internal secretions are deficient or perverted.
6. Correct gastro-intestinal errors by dietetic, digestive, antiseptic and purgative measures.
7. Eliminate katabolic products by diaphoresis and stimulate the normal activity of the skin.
8. Encourage elimination by the kidneys.
9. Reduce high blood pressure and regulate the cardiac and peripheral circulation.
10. Employ hypodermoclysis (local or general), when the poisons are unusually virulent, in order to quickly dilute the body fluids and thus lessen the corrosive action of the concentrated toxins.

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THE RELATION OF CEREBRAL DECOMPRESSION TO THE RELIEF OF THE OCULAR MANIFESTATIONS OF INCREASED INTRACRANIAL TENSION.*

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Because the pathogenesis of the intraocular manifestations of intracranial disease is still a matter of dispute, and because it would not be strictly germane to the present subject to discuss the arguments in favor of the various theories, I shall in this communication adhere to the old term, "choked disk," which is still preferred by some authors, and consider it synonymous with Elschnig's term, "papilledema," and not attempt to differentiate an optic neuritis due to toxins from a swelling of the disk which results from mechanical causes. Indeed, as von Hippel has stated, such a differentiation is certainly not justified on clinical and probably not on pathological grounds. No one denies that inflammation may be one of the causes of the swelling of the disk, nor that a combination of factors must be active under certain conditions. We cannot, however, be sure clinically, that is to say, by a mere appearance as determined by the ophthalmoscope, what exactly the cause of the process is. Of one thing only are we sure, namely, that increased intracranial pressure is the one cause of which we have most certain knowledge, even if there is a great difference in the results which have been reached through pathologic and experimental work. Furthermore, it has been abundantly demonstrated that, to use the language of Sir Victor Horsley, the release of increased intracranial tension arrests and cures papilledema or choked disk, and that for more than twenty years surgical experience abroad and in this country has proved the truth of this statement.

Palliative trephining or cerebral decompression has been utilized for the cure of choked disk, first in tumors of the brain and cerebellum; second, in various types of brain disease and meningitis; third, in injuries of the skull, for example, fractures, with or without epidural or subdural hemorrhage; fourth, in syphilis of the brain contents, for example, in gummas, pachymeningitis and other types of meningitis; fifth, in renal disease and in some types of anemia.

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*Read at the Philadelphia County Medical Society, January 11, 1911.

My personal experience represents an investigation of about 75 operations—some radical, some exploratory, and the largest number, decompressive operations—studied chiefly in the wards of the University Hospital in the services of Drs. Charles H. Frazier, Charles K. Mills and W. G. Spiller, and also in earlier days in the service of Dr. Keen in the Orthopedic Hospital, and more recently in the surgical service there of Drs. W. J. Taylor and G. G. Davis. A few additional cases have been seen in other hospitals in the charge of other neurologists and surgeons.

It also somewhat depends upon an investigation of the American literature of the subject, since 1900, which, in conjunction with Dr. T. B. Holloway, I analyzed two years ago, and reported the results to the Ophthalmic Section of the American Medical Association in June, 1909. In this analysis the records of 212 operations upon the brain, radical, exploratory and decompressive, were studied. As the result of decompressive operations, improvement or preservation of vision was reported in 76.5 per cent of the cases, while in 23.5 per cent, for various reasons, which are detailed in this communication, there was failure to save or preserve vision.[1]

Referring now only to the choked disk which occurs as the result of brain tumor, be this situated in the cerebrum or the cerebellum, we are accustomed in our examinations to attempt to divide the process into five stages, each representing appearances with which all of us are entirely familiar.[2] During the first two of these stages it is not uncommon to find good vision and often perfect vision. During the third stage vision declines, and in the fourth and fifth stages it has always markedly depreciated and frequently is practically lost. It goes without saying that the best results in the preservation of vision follow a decompression during the first and second stage of choked disk, and if the growth is localized and can be removed, sometimes at the first operation, but usually, especially if the Horsley method is followed, at the second operation, then the permanency of the cure is most apt to be established.

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[1] Among the reports of the decompressive operations, as we found them in the literature, only 34 contained really satisfactory eye records.

[2] This division of the development of choked disk into five stages is in a sense artificial, but it is convenient and more accurate than a mere statement that the process was "early" or "late."

Now while it is perfectly true that choked disk occurs in about 80 per cent of brain tumors, usually the intracranial neoplasm must have existed for some time and the increased intracranial tension have lasted for a definite period, before engorgement-edema develops. It is not possible to predict how soon the nerve-head changes will appear after a tumor begins to grow in the brain, and the period from the beginning of choked disk to the height of its swelling in some instances comprises only a few weeks; in others, months and even years may elapse before the disk-edema appears, and this is true also of tumors of the cerebellum, although they are apt to cause papilledema quickly. However, it is a well known fact that endotheliomata of the cerebellopontine angle may exist for long periods of time before they or their results are responsible for a choked disk.

So, too, in experimental disk-edema the rapidity with which choking of the disk develops has been very differently stated, some authors maintaining that even if the fluid is entirely bland, the swelling of the intraocular end of the optic nerve begins even while the experiment is in progress, while others maintain that it does not arise at all unless the injected fluid has an irritating quality, and this is practically my own and Dr. Frazier's experience.[1]

Just as we are not able to predict how soon after the beginning of a growth in the brain papilledema will appear, so also we are not able to determine with certainty from the stage of the disk or retinal phenomena what the duration of the cerebral lesion is, although we know that if it arises with great suddenness, or if there is a sudden increase in the swelling of the disk, it probably depends upon the facts that the growth has gained in volume, that there may have been a hemorrhage in it or around it, or that in some manner something has hap-

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[1] This statement applies to dogs, which do not satisfactorily lend themselves to these experiments. Monkeys should be used in researches of this character.

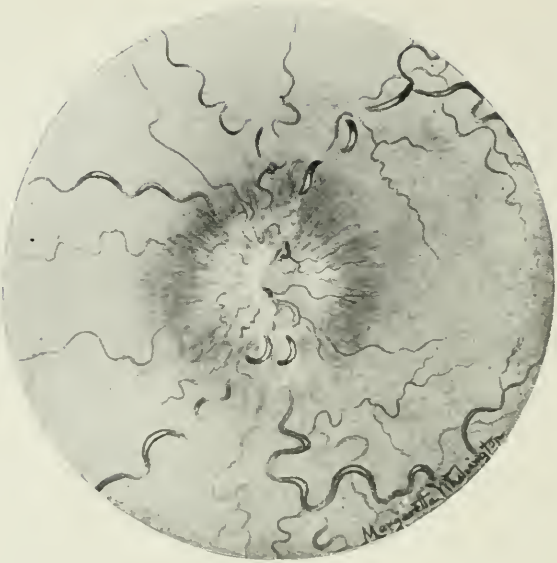

Figure A.—Fundus of the right eye of a patient with tumor of the brain and choked disk; swelling 6 D. (Service of Dr. Edward Martin in University Hospital.)

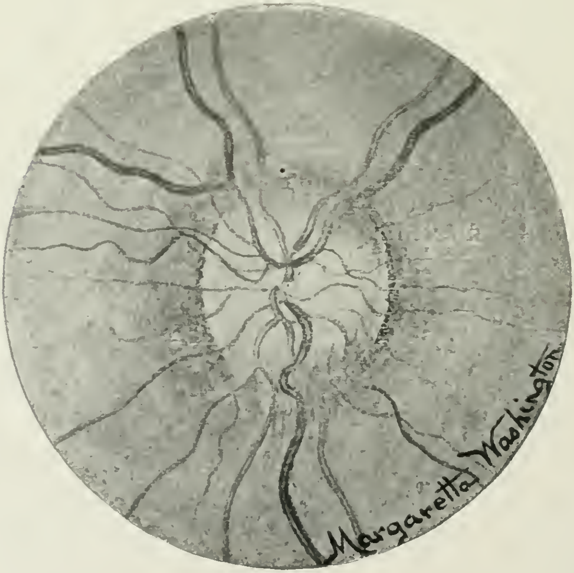

Figure B.—Fundus of the right eye of the same patient shown in Figure A one month after decompressing trephining.

pened which has suddenly raised the intracranial pressure. It is, in the language of Cushing and Bordley, the character of this intracranial pressure in its effect upon the cerebrospinal circulation which under most circumstances must determine the question of operative interference.

In a certain percentage of cases at the time of examination there is no choked disk, and as we have no means of definitely ascertaining whether or not it will develop, it is worth while to inquire whether there are any ocular symptoms, in the absence of choked disk, which would justify a palliative trephining in the sense of a preventive operation, just exactly, to quote Sir Victor Horsley, as we would not wait to remove a growth which was suspected of being malignant until lymphatic involvement had begun. The French have not avoided this, and speak of the "imminence of neuritis or edema." During this period the retinal veins, or only one division of them, become darker, more distended and more unevenly tortuous and more frequently curved, than is normal. This is due in all probability to beginning pressure on the vein from the intervaginal space, and represents a condition of affairs which may antedate even the first stages of papilledema, in spite of Mr. Leslie Paton's assertion to the contrary.

Again, it has been maintained by Cushing and Bordley[1] that in the presence of papilledema, but also in the absence of the first sign of choked disk, or of any of the appearances of the imminence of neuritis or papilledema, there may be alterations in the color fields, characterized by interlacing of the color lines, color inversion, that is, with the blue field smaller than the red, hemiachromatopsia, without corresponding change in the form field, islands of blue-blindness and blue-blindness itself, complete green-blindness and complete achromatopsia. From a study of their cases they are led to believe "that almost every patient brought for operation, after the diagnosis of brain tumor has finally come to be read by the ophthalmoscope, has at one time or another been regarded as hysterical or the subject of some psychoneurosis." Doubtless few would be willing to accept this statement without modification, although all of us are willing to agree that hysteria and brain tumor may frequently be difficult differentiations, and all must certainly agree that it is absolutely wrong to assert that because the so-called inversion of the color lines is demonstrable, the patient represents hysteria, or any other form of psychosis, although this condition of affairs may perfectly well be one of the significant signs of the symptom-complex.

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[1] Archives of Ophthalmology, Vol. XXXVIII, 5, 1909.

These important and interesting observations of Cushing and Bordley are not entirely new. As I have elsewhere[2] pointed out, visual fields resembling those seen in hysteria have been found in association with many organic conditions, for example, lesions of the posterior portion of the internal capsule, brain tumor (Charcot), tabes dorsalis, Friedreich's ataxia, and certain toxemias, notably those produced by lead, alcohol, mercury, bisulphide of carbon and dinitrobenzol. Years ago I described similar visual fields in patients with chronic and persistent headache studied in the service of Weir Mitchell, some of whom, I suspect, were also the subjects of unrecognized brain tumor, and similar observations have been made by Dr. C. K. Mills. No one, however, has studied and elaborated this subject as scientifically and satisfactorily as have Cushing and Bordley, even if, in their enthusiasm, they have assumed a position where not all are as yet quite willing to follow.

Where reversal and interweaving of the color lines are due to increased intracranial tension, as they frequently may be, decompression is followed by a restoration of the color fields to their normal sequence, as these charts made before and after an operation by Dr. Frazier very well show. I am distinctly of the opinion, however, that there is at present no justification in depending upon this sign alone as a certain one for recommending a palliative trephining, because even in normal eyes, in many cases of cerebrospinal disease and in a number of functional disorders, exactly similar visual field phenomena are present. I do not wish to shunt the symptom, because it is an important one, as Cushing's and Bordley's excellent researches have demonstrated. I only wish to warn against any exaggeration which may surround this importance.

Again, it is important that an investigation of the blind spot should be made, even before there are any signs (ophthalmo-

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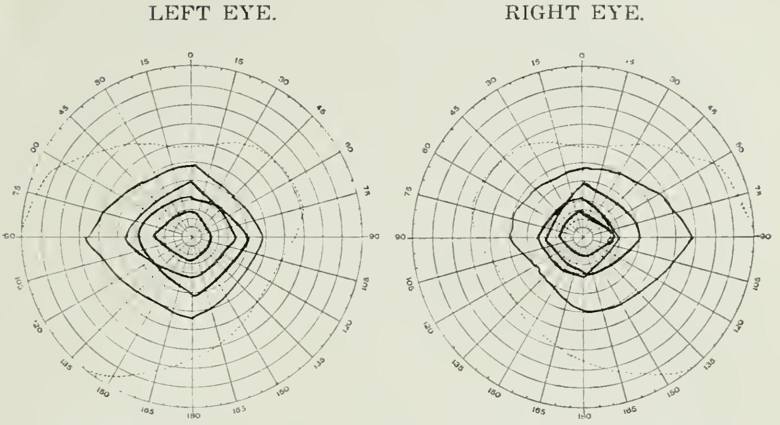
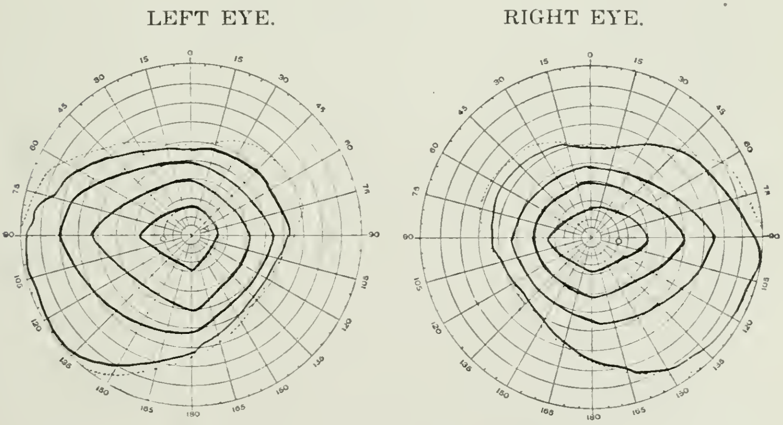
[2] The Eye and Nervous System, edited by Posey and Spiller. J. B. Lippincott Company, 1906.



LEFT EYE. RIGHT EYE.

Visual fields, before operation, of patient in service of Drs. C. H. Frazier and W. G. Spiller in the University Hospital, with symptoms of cerebello-pontile angle tumor and with hydrocephalus. Contraction of form fields and partial reversal of color lines. Double choked disks.



LEFT EYE. RIGHT EYE.

Visual fields of same patient seven months after subtentorial decompression. All symptoms had disappeared, and visual fields are practically normal.

scopic signs, I mean) of change in the nerve-head. We know that spindle-shaped enlargement of the blind spot may be an early sign of sympathetic ophthalmia, as has been shown by Ramsey and Sutherland. We know, too, that before either optic neuritis or retrobulbar neuritis appears in sinus disease, as has been beautifully demonstrated by Van der Hoeve, and confirmed by de Kleyn, there may be an enlargement of the blind spot, or that it may be surrounded in its enlarged state, or without this, by rings of color scotoma, and that with the relief of the sinus disease this condition of affairs disappears. These scotomas may antedate, sometimes by a considerable period of time, the organic changes in the optic nerve. Some studies made by Holloway and myself of the size and condition of the blind spot in patients with suspected brain tumor have as yet been too imperfect to record the results, but it is an examination which should be made in view of Van der Hoeve's work, to which reference has just been made.

Finally, it should be remembered that a very interesting symptom of brain tumor is the so-called temporary amaurosis, which may be evident prior to the development of choked disk and which may last from a few minutes to a few hours and may be followed by a restoration of vision to that which existed prior to its occurrence. It depends upon pressure on the chiasm from the third ventricle. When the repetition of this symptom, other things being equal, points to the existence of increasing intracranial tension, cerebral decompression should be considered, even in the absence of choked disk. In other words, it is not necessarily on the first development of papilledema, but on the first signs of visual failure that palliative trephining is indicated if sight is to be saved. (Paton.)

It is not in my province to discuss the neurological symptoms of brain tumor in the absence of choked disk, but if any one wishes to read a radical statement from this standpoint, he should consult Sir Victor Horsley's last article,[1] in which, without reference to ophthalmoscopic changes, he maintains that exploratory operation is strongly indicated in any case of localized epileptiform convulsions, or in any case in which there is any sign of progressive motor or sensory paralysis from intracranial causes.

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[1] British Medical Journal, December 10, 1910.

It would, therefore, seem correct to conclude that the most satisfactory treatment for the purpose of preserving vision in any case of choked disk not due to a toxic process or constitutional disease (infectious optic neuritis), but depending upon increased intracranial tension, is cerebral decompression, with, if possible, an immediate or subsequent removal of the growth; that if operation can be performed early, that is, during the first or second stage, the prognosis as to sight is fairly good; that the statement that one must wait for the appearance of a choked disk before resorting to this operation must be modified in favor of immediate operation, provided such other symptoms as I have described are present and the general and neurological examinations indicate the presence of a lesion that is raising the intracranial tension; and that in nonsyphilitic cases time devoted to the administration of iodids and mercurials is time wasted.

Unfortunately, many patients come when the intraocular lesions are far advanced. There is still some chance of preserving or improving vision if the third stage of papilledema is present, but very little if the fourth and fifth stages have been reached and there is marked depreciation of sight. In a previous communication with Dr. Holloway we stated that even under these circumstances the operation should be performed, because it sometimes preserves such vision as still remains; but I wish to modify this in the light of more recent experience by the statement that only too frequently, when the process is far advanced and the visual acuteness very poor, or when the field of vision is much contracted, especially if it is contracted close to the fixing point, even though direct sight may still be tolerably good,[1] there is failure to check the degradation of vision, and I wish to italicize the statement that *in a few cases the apparent effect of the operation has been to hasten the onset of blindness.* Naturally, I speak purely from the visual standpoint, and do not elaborate the fact that the operation may be indicated to relieve headache or vertigo, or any of the other general symptoms of brain tumor, but that the hope of saving vision is slight, and the patient, or the patient's friends, must definitely understand this.

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[1] This is well illustrated in the case of a patient recently under the care of Drs. Frazier and Spiller, and studied by myself and Dr. Holloway. He had a high degree of choked disk (3-4 D.), in the third stage, his visual fields were greatly contracted, both nasal halves being entirely absent, the dividing line practically touching the fixation point. Direct vision was 6/15, maintained for a few minutes at a time with difficulty. A technically correct and eminently successful operation by Dr. Frazier relieved the general symptoms, but vision was rapidly lost within a few days. The tumor was in the cerebellopontine angle.

A very important matter, to which much reference has been made in recent times, is the necessity of trephining after injuries to the head, which, according to some authors, are frequently followed by papilledema, more frequently in their statistical inquiries and personal observations than it has been possible for me to ascertain in my own investigations. Nevertheless, every patient with an injury of the head, whether associated with a demonstrable fracture or not, should be frequently investigated with the ophthalmoscope, and if there is the development of papilledema, surely one of the indications for trephining is present, even in the absence of any other surgical reason. It must, however, be definitly stated that in some of these cases the entire intraocular process rapidly disappears without surgical interference, as was demonstrated in a startling manner in two patients not long ago in the University Hospital, one in the service of Dr. Martin and the other in the service of Dr. Frazier. In both instances an active papilledema followed a blow on the head. The disk edema disappeared without the slightest trace remaining, and with full preservation of vision and general functions, no operation having been performed.

In this connection I would like to refer to one important point in diagnosis, to-wit, the presence of the so-called spurious optic neuritis, which is sometimes with difficulty distinguished from a real choked disk, and which is usually associated with refractive error.[1] A patient recently under my care with a vague history of injury of the head revealed to the ophthalmoscope an apparent edema of the disk, which closely simulated choking of the nerve-head. For a long period of time decompression was debated, but all of the symptoms, headache, vertigo, mental disturbance, nausea and vomiting, disappeared after the correction of the refractive error, a hyperopia of 4 D. and an astigmatism of about 1 D. I have just stated that time devoted to the administration of remedies is time wasted if brain tumor is present, but time devoted to accurate observation is never wasted, and I again wish to italicise the statement, that palliative trephining must not be done simply because appearances resembling a choked disk are present until an accurate search has been made for causes other than increased intracranial tension which may be responsible, not only for the ocular, but for the general symptoms. Most of the measurements of choked disk are utterly useless unless there is a definite statement of the refraction of the eye, and comparative measurements of the height of the disk and of the retina must be made at different portions of the fundus if the real height of the swelling is to be ascertained. Failure in this respect, in some reports, adds to the doubt of the value, the localizing value, that the greater swelling of the disk is found in the eye homolateral to the tumor. That this symptom is an important one in association with other signs is not to be doubted, but it certainly is not, by itself, an entirely safe guide.

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[1] Holloway and I have discussed the differential diagnosis elsewhere. Therapeutic Gazette, July 15, 1909.

From this digression I return to injuries of the skull, and repeat that in them the rapid appearance of papilledema is certainly one of the indications for trephining, with this modification, namely, that it is not always necessary to make the operation, as in a certain number of instances the lesions disappear without the release of intracranial tension through operative interference.

We are accustomed to say that iodids and mercurials should not be given in nonsyphilitic brain tumors. When, however, a Wassermann test indicates the presence of syphilis, the question arises whether or not in the presence of optic neuritis or papilledema a decompressive trephining should be performed. Sir Victor Horsley questions whether a gumma of the brain ever disappears entirely under the administration of mercurials or iodids if it has been of long standing. At least, he asks for proof of this. He surely, however, would not deny that all symptoms, ocular and otherwise, of many cases of cerebral syphilis are rapidly dissipated by properly administered courses of mercury, and therefore he is willing that six weeks should be devoted to a mercurial course, but if this fails and the intraocular symptoms continue, a palliative trephining is indicated. My own experience in this particular line of cases is too limited to express a positive opinion, except to state that I should certainly hesitate to recommend for a so-called syphilitic optic neuritis a palliative trephining until a thorough anti-syphilitic course, no matter what remedy is employed, had been pursued. If, however, at the expiration of six or eight weeks, the choking of the disk continued and the vision threatened to fail, or was actually failing, a simple decompression would seem to be a justifiable procedure.

Cushing and Bordley[1] incline to the view that "albuminuric retinitis" is due, in large part, to cerebral edema and that the neuroretinal lesion in nephritis is a modified form of choked disk. Cushing has advised and has performed cerebral decompression for the relief of uremia with choked disk, with temporarily good results.[2] My own experience in this respect is limited to one patient, with extensive albuminuric neuroretinitis. Cerebral decompression was performed, not by my advice, without the slightest good result. Death followed not long after the operation.

I confess that with my knowledge of the pathology of the retina and retinal vessel lesions under these circumstances it is difficult for me to believe that a palliative trephining could be of any permanent service in the relief of the visual disabilities of albuminuric retinitis, although I do not for a moment question that increased intracranial tension plays a rôle in the production of the papillitis of nephritis which may accompany the retinal disease as an added part of the process. Perhaps blue-blind areas and blue-blindness of this disease may depend upon this factor.

It has been definitely proven that ordinary anemia is sometimes associated with marked papilledema, and some observations of my own and of Dr. William Campbell Posey are familiar to the members present. Because the ordinary treatment of anemia has in a number of instances been followed by the disappearance of the intraocular lesions, I should hesitate to recommend trephining as a curative procedure, and certainly hesitate to recommend it unless a long course of arsenic and iron had been tried. I have myself seen complete restoration of vision under these conditions, and Dr. Posey has reported like results. It is probable, however, that even in these cases increased intracranial tension has to do with the development of the disk changes. I need hardly point out the extreme difficulty of differentiating between a choked disk due to anemia and a choked disk due to increased intracranial tension in an anemic subject, when this rise in tension is not caused by the anemia, but by an intracranial lesion.

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[1] American Journal of the Medical Sciences, October, 1908.

[2] See also a discussion of this subject by N. M. Semple, American Journal of Ophthalmology, 25, 1908, p. 365.

I do not concern myself with the many interesting phases which surround the operation of palliative trephining for any of the conditions which I have named, particularly with certain complications and disappointments connected with the operation: when in a certain number of instances there is no subsidence of the choked disk, although there may be some improvement in vision: when there is delay in the subsidence of the choked disk with ultimate restoration of good vision; when there is sometimes a sudden increase in papilledema; when hemorrhages develop in and around the disk; when the operation may preserve the vision of one eye while the vision of the other eye rapidly fails; and when, even after technically correct operations, there is, sometimes, although the papilledema may still be in an early stage, a rapid loss of vision. Nor shall I take up any more time than I have in a discussion of how the disk swelling should be measured, of the earliest stage at which subsidence is noted, and of the conditions which may cause a delay in the development of optic disk changes; but I shall, with your permission, requote and slightly modify certain conclusions already reached from the experience to which I have made reference, namely:

Naturally, the best results are attained by early cerebral decompression, that is, when the disk changes are not yet associated with much depreciation of visual acuteness and contraction of the field of vision.

The indications for operation do not depend alone on ophthalmoscopic examination, but on an examination of the visual field, of the size of the blind spot, of the light-sense and periods of temporary obscuration of vision, and vision is not properly recorded until there has been a thorough investigation of the refraction of the eye and the visual test has been made with the aid of the glasses which give the most satisfactory result.

All head injuries, whether fracture of the skull is present or not, should be carefully investigated from the ophthalmoscopic standpoint, as well as from the other standpoints which have just been described. The presence of a papilledema, which sometimes is conspicuously evident, is an indication for operation, but not a peremptory one, as sometimes the appearances subside without operative interference.

The medicinal treatment of brain tumor has nothing to commend it except when the symptoms depend upon syphilis; if, after a thorough mercurial or other anti-syphilitic course lasting from six to eight weeks, there is no subsidence of the intraocular swelling of the disk, decompression should be considered.

While the prognosis as to sight, if a late stage of papilledema is present, is extremely unfavorable, the operation may have to be done for other reasons, but this unfavorable visual prognosis should be made very plain to the patient, and he should understand that the operation itself, under these circumstances sometimes hastens the impending blindness; occasionally it seems to check it, and sometimes even very defective visual power is really improved by the operation.

I leave it to the general surgeons to indicate the position most favorable for trephining operations under the circumstances which have been detailed, except to state that in all pretentorial tumors temporal decompression is the operation of choice, and in subtentorial tumors a subtentorial decompression is indicated.

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THE OCULAR COMPLICATIONS OF THE ACUTE EXANTHEMATA.*

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The ocular complications of the acute exanthemata occupy a position in the management of these diseases, dependent not only on the site and extent of the lesions, but also on their early recognition and prompt treatment. A neglected conjunctivitis, or failure to institute prompt treatment in a beginning corneal ulcer, may result in serious impairment of vision or possibly the entire loss of sight. It is with such possibilities in mind and also a recognition of their diagnostic and prognostic import, that the following brief sketch of the ocular complications of the acute exanthemata is undertaken.

SMALL-POX.

During the course of small-pox the greatest variety and the most serious forms of ocular complications may exist. Ulcers of the cornea are perhaps the most common and certainly the most disastrous in their results. Before the advent of vaccination about one-third of all blindness was due to small-pox, but since vaccination has become general this percentage has been reduced to between 2% and 7%. It has been estimated that from 38% to 78% of the diseases of the eye caused by small-pox are affections of the cornea (Parsons)[1]. Chance[2] found 36 cases of corneal ulcer in 2,000 cases of small-pox observed by him in the epidemic in Philadelphia in 1901-1902.

These ulcers may be secondary to conjunctivitis, pustules at the corneal limbus, lesions of the lid borders, or entirely independent of such causes. There has been much discussion as to whether the small-pox lesions formed primarily on the cornea, and also whether the infection was not at times an endogenous one carried by the blood current, but as de Schweinitz[3] states, "Shirmer's investigations indicate that the so-called variolar abscess of the cornea which has been hitherto considered an endogenous infection, arises by penetration of the virus from without." As a rule the ulcer appears during the fourth stage or stage of desiccation, ranging from a simple infiltration to a deep, progressive abscess with hypopyon, ending in perforation and prolapse of the iris, and possibly panophthalmitis. Ulcers may appear earlier, however, and the rapidity of their progress is proportionate in a measure to the virulence of the general infection. It has been noted that early involvement of the cornea, especially when both eyes are affected, is usually the forerunner of a fatal collapse. Small-pox pustules at the limbus are very prone to form ulcers, which, however, are rarely as destructive as the serpiginous form seen later in the disease.

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*Read before the Philadelphia County Medical Society, January 11, 1911.

The conjunctiva often shows a mild catarrhal inflammation, the intensity of which bears a close relation to the severity of the general infection, although this is by no means a constant factor. Rarely the conjunctivitis may assume a pseudo-membranous form, or be severe enough to resemble a purulent ophthalmia. In severe cases, especially those in which the lesions are numerous on the face and eyelids, pustules frequently form on the conjunctiva. These resemble phlyctenulæ, and are usually accompanied by intense chemosis and swelling of the lids.

The lid complications are entirely secondary to the ulceration following pustules. During the active course of the disease the lid margins may present a severe form of ulcerative blepharitis, after which entropion, trichiasis or distichiasis may be observed.

In a considerable proportion of the cases presenting ocular complications, iritis, cyclitis or chorioiditis have been observed during the fourth stage of the disease either singly or in combination. More rarely acute and chronic dacryocystitis, retinitis, neuroretinitis or glaucoma have been observed.

Many of the most destructive ocular complications in variola may be modified if aseptic or antiseptic measures are adopted. As a result of this experience in a small-pox epidemic, Baker[4] writes, "when * * * every possible precaution was taken to disinfect the structures around the eye, there was an appreciable falling off in the number of eye complications. Fewer cases of corneal complications developed, and our cases progressed better when a routine practice was adopted of frequent washing of the lids and face with 1-4000 bichloride, and flooding the conjunctiva four or five times daily with saturated boric acid solution, and on the first evidence of corneal complication an instillation of 1% solution of atropine sulphate two or three times daily."

VACCINIA.

Occasionally after vaccination, phlyctenular disease of the cornea or conjunctiva may appear, but this is rarely of any consequence. Of much more importance are those cases in which the eye becomes involved through accidental inoculation. Frequently the victims are women who nurse recently vaccinated children, and a number of cases have been reported in which the vaccine virus has been accidentaly thrown into the eye. In these cases ulcers of the conjunctiva may form, associated with very marked injection and chemosis, and as a rule, with swelling of the pre-auricular gland. Vaccine ulcers of the lids are not uncommon, and secondary ulcers of the cornea, when they occur, form a serious complication. Shirmer[5] collected 48 cases of secondary infection of which 8 cases showed ulceration and 5 deep keratitis. The ulceration is usually marginal and sickle-shaped, while the deep variety of keratitis is very chronic, leaving a permanent corneal haze which may seriously interfere with the vision. (Parsons.)

MEASLES.

One of the most constant early symptoms of measles is an acute catarrhal conjunctivitis. This usually runs a mild course, is easily controlled by the frequent use of boric acid solution, and disappears in from ten days to two weeks.

At times the conjunctivitis may take on a pseudo-membranous form, when it becomes necessary to exercise unusual care to prevent the cornea from becoming involved. Various investigators have examined the conjunctival secretions during the course of measles. Morax[6] described two distinct types of conjunctivitis: (1) a mild catarrhal form due directly to measles, and not associated with any particular organism, and (2) a more severe form due to an anterior or simultaneous infection, caused by pathogenic organisms, often the Koch-Weeks bacillus or the Morax-Axenfeld diplo-bacillus. Schottelius[7] examined the conjunctival secretions of eighty cases of measles and found virulent streptococci, and in many also staphylococcus albus and aureus. A streptococcic infection is especially dangerous because of the rapid destruction of the cornea which often takes place.

Apart from their association with severe conjunctivitis, ulcers of the cornea are rarely seen as a complication of measles. Far more frequently, according to Trantas[8], may be observed a superficial punctate keratitis. As a result of his investigations he found this condition to be present in no less than 76% of the cases, and considering this large percentage, Trantas is inclined to regard it not so much as a complication but as a pathognomonic symptom of measles. The keratitis usually begins on the third, fourth or fifth day of the general illness and takes the form of a slight cloudiness of the cornea with numerous superficial, whitish spots visible with the loupe. This usually affects both eyes, may or may not be associated with symptoms of irritation, and disappears without treatment in two or three days. The presence of this superficial punctate keratitis of Trantas may be helpful in differentiating measles from other exanthemata when the diagnosis is doubtful.

Among the rare ocular complications of measles some observers have recorded phlyctenules of the conjunctiva and cornea, paresis of the extraccular muscles, metastatic chorioiditis and optic neuritis.

A case of optic neuritis following measles was recently seen by the writer at the Wills Hospital in the service of Dr. S. Lewis Ziegler. The patient, a girl 8 years old, became blind in both eyes during her convalscence from a mild and uncomplicated attack of measles. Upon examination the right eye was found to be totally blind and the left retained light perception only. Both eyes showed a very marked degree of optic neuritis. Under active catharsis and diaphoresis, together with the internal administration of Donovan's solution and thyroid extract, the vision improved rapidly. In about six weeks the neuritis had completely subsided, leaving the disks very pale and apparently atrophic. The patient was then put on strychnia nitrate and negative galvanism. This was continued for five months, at the end of which time vision in each eye was normal, and the visual fields showed no contraction for form or color.

SCARLET FEVER.

Conjunctivitis does not form a part of the clinical picture of scarlet-fever, and is infrequently observed. When present, according to Parsons[9], it is probaly due to the introduction of epithelial scales into the eye from the lids, the skin of which is nearly always affected. In rare cases a pseudomembranous conjunctivitis occurs, due to a streptococcic infection, in which case it becomes a serious complication since corneal involvement of an unusually severe character is set up, followed by rapid destruction of the cornea. Aside from this condition corneal ulcers are seldom seen.

The most frequent and most important ocular complication during scarlet-fever is uremic amaurosis. Sudden blindness may appear without any external or ophthalmoscopic signs, except slight dilatation of the pupil, and is often accompanied by convulsions. Albuminuric retinitis is rare in the acute nephritis of scarlet-fever, but may be seen as a result of a chronic nephritis. In such a case the prognosis as a rule is better than in cases which develop independent of scarlet-fever.

Among the rarer complications may be noted internal and external ophthalmoplegia, a case in which the left internal rectus was paralyzed having recently been reported by Terrien[10]. Phlyctenular disease of the conjunctiva and cornea is more common during and after scarlet-fever than in measles. Acute and chronic dacryocystitis is quite common, and dacryoadenitis may occur and be followed by suppuration of the gland, a termination seldom seen in measles. Behse[11] saw double metastatic ophthalmitis develop, and Fuchs[12] notes the occurrence of metastatic chorioiditis, metastatic orbital cellulitis and retrobulbar neuritis.

CHICKEN-POX.

But few ocular complications occur during the course of varicella. The conjunctiva is rarely affected by the eruption, which, however, frequently appears on the lids without any consequent damage. The eruption may, according to Comby[13], appear first on the lids. Aside from the eye complications secondary to nephritis, which occasionally follows chicken-pox, other complications are practically unknown.

TREATMENT.

The treatment of the above ocular conditions may be considered apart from the diseases in which they occur. In those cases which present a simple catarrhal conjunctivitis, flushing the conjunctiva several times daily with boric acid solution will usually control the inflammation. Should the pseudo-membranous or purulent form develop, active measures must be instituted to destroy the infecting organisms and combat the swelling. To this end there should be frequent irrigation of the conjunctival sac, the application of ice-pads, and a one or two per cent. solution of silver nitrate applied daily, in conjunction with the use of argyrol or protargol. In suitable cases streptococcic serum may be employed, or an autogenous vaccine prepared.

Phlyctenular disease of the conjunctiva and cornea requires the use of a mild antiseptic lotion, and the introduction into the conjunctival sac of yellow oxide of mercury or calomel. Fresh air, nutritious diet and tonics form an essential part of the treatment in these cases. Atropine must be instilled if there is much ciliary congestion.

Simple ulcers of the cornea are best treated by the use of atropine sufficiently often to maintain mydriasis, and a boric acid solution. If the ulcer is a progressive one, and begins to spread, the more active measures of curettement or cauterization must be employed. Atropine is the most important remedy to be used in cases of iritis or iridocyclitis. In addition, leeching at the temple, hot compresses, and the use of mercurial purgatives should be added to the treatment. In rare cases where a chorioiditis, retinitis, optic-neuritis or retro-bulbar neuritis is encountered, the treatment in general consists of diaphoresis, catharsis, hypodermoclysis, the injection of formalin (½%) into the vitreous chamber in cases of suppurative chorioiditis, the exhibition of mercury, and protection from light by means of dark glasses, although this may be modified or supplemented by additional therapeutic measures according to the condition encountered.

1925 Chestnut Street.

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VACCINE AND SERUM THERAPY IN DISEASES OF THE EYE.*

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For the purpose of this symposium it is unnecessary to detail the methods by which immunization of the individual against diseases is produced. It is sufficient to state that this may be accomplished in two ways: 1st, by the use of *vaccines* which stimulate the tissues to produce antagonistic substances, so-called antibodies; 2d, by introducing *sera,* which are antibodies already formed, into the system.

The methods adopted for the diagnosis of ocular lesions by the use of vaccines or bacterins in no way differ from those used to determine the character of lesions elsewhere in the body, though the results secured are somewhat more definite. A positive reaction in visceral as well as ocular lesions indicates only the presence somewhere within the economy of disease foci, and in the case of a visceral lesion, frequently this is all that is determined, as the disease foci may be in an organ other than the one which at the time presents symptoms. In the eye, however, the possibility of obtaining a visible local reaction indicates definitely the specific character of the inflammation.

The importance of obtaining a local reaction does not seem to be fully accepted, as some clinicians hold that when the symptoms suggest (for instance) tuberculosis, a typical general reaction is sufficient basis for a positive diagnosis. Personally, I hesitate to accept this view. The clinical diagnosis of tuberculosis of the eye is still in the formative stage and I believe, therefore, we should insist on a local reaction to establish the diagnosis. It is true, however, that there may be local conditions which might prevent a local reaction.

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*Read before the Philadelphia County Medical Society, January 11, 1911.

SERUM AND VACCINE TESTS.

For the present purposes, these may be divided into two classes: Those that are undertaken to establish the ocular diagnosis, and those in which the eye is used to attain a reaction to establish the general diagnosis.

It is not within the province of this paper to describe these various tests, but it is of interest to note their present status. The subcutaneous test undoubtedly is the most reliable and most generally employed. Von Pirquet's is reliable, and has the advantage of safety, and of causing the patient but little discomfort. Of the ophthalmo-tuberculin test little need be said at this time. A test delicate in the extreme, it was unfortunately applied to structures equally as delicate and incapable of protecting themselves by the production of antibodies, so that, today, many eyes bear permanent signs of our past zeal.

By some, particularly by Irons and Weeks, gonococcal vaccine is considered of much value in the diagnosis of obscure affections due to the gonococcus. According to Irons the reaction is characterized by a slight rise in temperature, and a variable feeling of malaise coming on in from 8 to 12 hours, and lasting usually 24 hours. This may be accompanied by a decided tenderness at the site of the infection. The test dose is from 20 to 100 millions.

Following the suggestion of Chantemesse, several clinicians, notably Beckers, and Floyd and Baker, have investigated the conjunctival reaction to typhoid toxin, and the result so far secured would seem to indicate that it is a fairly constant reaction, especially marked in the severely toxic cases, and appearing only during the active stage and reappearing if relapses occur.

Regarding the value of the Wasserman serum reaction in establishing the specificty of an ocular lesion, there seems to be a general willingness on the part of ophthalmologists to consider it conclusive, especially if the tuberculin test is negative, as tuberculosis is the only other disease producing similar appearing inflammations. According to Butler it is found positive in from 90 to 85 per cent. of all cases with syphilitic manifestations; in from 50 to 60 per cent. of latent cases, and in from 70 to 80 per cent. in parasyphilitic diseases.

However much the general practitioner may have been aided by the introduction of serum therapy, with but a single exception it has not materially strengthened the ophthalmologist in his fight against disease processes. When we come to inquire the reason for this we find it in the want of susceptibility of some of the tissues to bacterial immunity, and the rapidity of the progress of purulent processes in others. The cornea shares in general bacterial immunity. Antitoxines pass into the normal aqueous, but bactericidal substances and opsonins do not, except in slight amounts after puncture of the cornea or inflammation. The vitreous normally does not share at all in immunity. Only after repeated paracentesis or subconjunctival injections, or during inflammations, are there the slightest traces of immunizing bodies.

As Axenfeld, to whom we are indebted for many of the above facts, says: "Antibacterial serum therapy, active or passive, must in intraocular diseases, in which infection has extended to the media, experience great difficulties in its combat against the bacteria." But he adds, that as we possess the means of increasing the intraocular immunizing processes, and as the disease itself, injury or operation, produces an increased influx from the altered vessels into the media, they should be given a trial.

THERAPY IN LOCAL MANIFESTATIONS OF GENERAL INFECTIONS—TUBERCULIN.

Weeks has given the results obtained by practitioners in Canada and in this country in the treatment of a great variety of tuberculous affections of the eye and the adnexa, including involvement of the lids, conjunctiva, cornea, sclera, iris, chorioid and retina. The total number of cases was 58, and of these, virtual cures were observed in 35, and improvement in 15. Derby records 30 cases of ocular tuberculosis treated by tuberculin. Of these, there were 15 cases of sclerokeratitis, 9 of interstitial keratitis and 6 of kerato-iritis. He states that on the whole, the results were favorable, although in a number of cases it is by no means certain that a cure would not have taken place as speedily without the use of tuberculin. The same writer says that a careful study of the literature, and his own experience extending over four years, point out the fact that certain tuberculous affections of the eye are less favorable for treatment than others. Conjunctival tuberculosis is most resistant to tuberculin. Of the bulbar types there is some ground for believing that the chorioidal is less amenable to treatment than are the other forms. He finds that in the opinion of nearly all writers, tuberculin has proved of decided value in ophthalmology. From a limited experience, and from the results he has seen in the service of some of his colleagues at Wills Eye Hospital the writer is of the same opinion.

METHOD OF ADMINISTRATION.

Among ophthalmologists in general the method of administering tuberculin is that advised by von Hipple. Beginning with a dose of 1-500 mg. of either T. O., T. B. or B. E., and increasing by this amount every third day until a general reaction is obtained. When this has been obtained a general period of 48 hours is allowed to elapse from the time the temperature has returned to normal, before resuming the injections. The dose is now regulated so that the effect on the patient is just short of a general reaction. This does not necessarily imply that the dose will have to be diminished because, as a toleration is established, larger and larger doses may be required to secure the same result. The maximum dose, however, is 1 mg. The interval between the injections is increased when the active stage of inflammation is passed.

GONOCOCCUS VACCINE.

Weeks in summing up the evidence available as to the use of gonococcal vaccine, states that it is proven that it is a valuable therapeutic agent in the treatment of manifestations of chronic gonorrhea. It is of very little or no value in acute gonorrhea. Shumway quotes Eyre and Stewart as having treated four cases of iritis in which the gonococcus was isolated, with the polyvalent serum. Three cases were cured in from 3 to 6 weeks. He adds a case of his own in which a cure was effected in 3 weeks' time. Because of the difficulty, and in most cases impracticability of obtaining homologous strains, polyvalent vaccines have been exclusively used. The practice of many in this country has been to employ large doses. Shumway's patients received 300,000,000 organisms.

Weeks, however, obtained very satisfactory results with much smaller doses.

STREPTOCOCCIC VACCINE.

There is no literature relative to the value of streptococcic vaccine in purely ocular conditions. The importance, however, of erysipelatous inflammations about the eye makes it of interest to note that its use in this condition has been at least encouraging.

STAPHYLOCOCCIC VACCINE.

In the few reported instances in which this vaccine has been employed in inflammatory conditions in and about the eye, the results have been good. Todd reports one case of chronic hordeoli, with pustules on the face and eczema around the nostrils, and although the patient has been unsuccessfully treated by other methods intermittently for five years, complete recovery followed the use of autogenic vaccine of *s. aureus*. Surmising from the earlier work of Bach that the persistence of phlyctenular lesions might, in some cases, be due to secondary infection, Gradle tried these vaccines in nine cases. None got well faster than cases occasionally do, but in every instance improvement took place after the second or third injection.

COLEY'S TOXINES.

This is a vaccine composed of the streptococcus pyogenes and the bacillus prodigiosus. It is of special interest to the ophthalmic surgeon in connection with sarcoma of the orbit where it should be particularly useful in preventing recurrence after exenteration. Apparently the only successful case is that of Tilley in which an inoperable sarcoma of the orbit disappeared under three weeks' treatment with the serum.

SERA—DIPHTHERIA ANTITOXIN.

This serum is employed in ophthalmology to meet two very different indications. It has been of undoubted value in diphtheritic conjunctivitis, and indeed, according to Axenfeld, where it fails there is either a mixed infection, or the treatment has been too long postponed.

The value of diphtheria antitoxin in the management of post-diphtheritic ocular palsies is very doubtful. According to Fage, paralysis of accommodation has been more quickly recovered from where it has been employed.

TETANUS SERUM.

As was to be expected from the success attained by this serum in the prophylactic treatment of wounds elsewhere, in the few cases where it has been employed in wounds about the eye, the dreaded symptoms did not appear.

STREPTOCOCCIC, STAPHYLOCOCCIC AND GONOCOCCIC SERA.

These seem to be no more efficient than the respective vaccines, and so far as our meager statistics permit of a judgment being formed, in the case of the gonococcic serum it appears to be distinctly less efficient. Of course, it is impractical to employ the autogenic vaccines in the treatment of rapidly destructive inflammations of the cornea, and as it is necessary to use heterogenic substances, this may explain the far from satisfactory results so far obtained with pneumococcic and streptococcic therapy in these conditions. They are to be employed only as adjuvants to surgical and other therapeutic measures.

NON-SPECIFIC SERA.

According to some clinicians quite as good results are obtained with non-specific sera as with the specific sera. Darier and Deutschmann claim that many of the sera, particularly the anti-diphtheritic, the anti-tetanus, and the yeast serum, act as against all kinds of infections, as they stimulate all of the organs of the body to the production of antibodies of all kinds. Both of these writers are therapeutic enthusiasts. Their adherents also report cures that are little short of marvelous. The experiments carried on in the Freiburg laboratory under Axenfeld fail to show that any of these sera exercise either a prophylactic or a curative action on experimentally produced inflammations of the eyes of rabbits.

NOT DEFINITELY CLASSIFIED SERA.

The occurrence of conjunctivitis in hay-fever has led to the employment of Dunbar's *"Pollantin"* and *"Graminol"* for the ocular inflammation. The results so far obtained warrant a continuance of their use.

Rarely the ophthalmic surgeon is compelled to use jequiritol to clear up pannus resulting from trachoma. The procedure is always undertaken with trepidation, as the resulting inflammation may not be only alarming but actually destructive. To inhibit this reaction Roemer has introduced *Antiabrin* serum. So far the reports as to its efficiency are conflicting.

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RESTORATION OF CONTRACTED SOCKETS AFTER ENUCLEATION OF THE EYE-BALL—ADVANTAGES OF THIERSCH'S SKIN GRAFTS OVER OTHER METHODS OF TREATMENT.*

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Contracted sockets after enucleation are caused either by proliferation of the conjunctiva, or by the formation of cicatricial tissue and bands in the orbit. The object of all of the different operations is to restore a cavity large enough to hold with comfort an artificial eye. To obtain such a result all abnormal adhesions must be thoroughly separated, new cul-de-sacs, representing the effaced fornices conjunctivæ, formed and the union of the raw surfaces prevented. Mechanical means to keep the parts separated have been used, such as shells of different material between the detached lid and the orbital tissues, without the least benefit, and consequently today they are considered absolutely useless. The only rational way, proved by experience to be somewhat successful, is to transplant mucous or skin flaps into these raw surfaces, and thus prevent their reunion. Mucous flaps may be taken from the conjunctiva of rabbits, from the lips, mouth, or from the vagina of the patient and kept in the new position with appropriate sutures. Haltenhoff has replaced the conjunctiva by the skin of frogs.

All of these transplantations have proved unsuccessful, for, after a short time, their surfaces become thickened by proliferation, on account of which the artificial eye cannot be worn. The skin flaps are pediculated and non-pediculated, these latter comprising either the entire thickness or only the superficial layers with the apices of the papillae (epidermic grafts). Non-pediculated flaps are used in Week's operation, which, in brief, is as follows: A free canthotomy is made, the lid is thoroughly separated from the tissues of the orbit, a Wolf's flap is removed from the inner part of the arm one-third larger than the surface to be covered and is folded so that the epithelial surfaces are in apposition. Three double armed sutures are passed through the bottom of the flap, the apex of the deep groove, produced by the separation of the adherent lid, and made to emerge on the skin of the cheek, where they are tied on small rolls of gauze. The margins of the flap are attached by interrupted sutures to the margin of the lid and to the margin of the mucous membrane of the orbital stump, and finally a suitable plate is placed in the cul-de-sac and there maintained until an artificial eye can be inserted. Grunert in cases of total symblepharon of both lids separates them completely from the mucous membrane of the orbit, makes two divergent incisions from the external canthus, turns out the lids thus freed with threads tied on glass beads above and below, and covers the raw surface, including the ectropionized lids and the space produced by the incision at the external canthus, with flaps of skin taken from the arm. After three weeks the outer lid angle is again united and a glass eye inserted. Pediculated flaps in different ways have been thrust between the orbital tissues and the separated lid, through an opening cut in the latter. Taylor took the flap from the outer side of the lower lid, twisted it 180° on its axis and pushed it through a button-hole into the orbit. Harlan (1890) after having separated the lower lid from the orbital tissues, cut an oblong flap from the upper part of the cheek, dissected it, except at its ends, made an incision above the margin of the orbit throughout the entire thickness of the lid, passed the inverted flap through it, and stitched the free edge to the lid margin. The bare space on the cheek was covered by uniting the edges of the wound with appropriate sutures. Rogman (1892) made a quadrilateral flap with the base corresponding to the lower fornix, and the apex toward the cheek, passed it through an incision near the margin of the orbit, and stitched the apex to the free margin of the lid, so that the epidermic surface faced the orbital cavity. Maxwell cuts a semilunar flap on the cheek, detaches it, except in the center, draws it through an incision at the base of the lower lid, stitches the upper margin to the orbital wound and the lower to the palpebral, and closes the wound of the cheek with sutures. To get a good result the incision in the orbit must be as long as the space will permit, the skin flap considerably larger than this, and the part not dissected in the center of the flap as long as the incision in the cavity of the orbit. Samelsohn, if the adhesions are in the lower lid, cuts a quadrilateral flap in the upper one, dissects it, except at the base on the ciliary margin, then turns it down so that the raw surface comes in contact with that of the lower lid, and lastly stitches its edge to the bottom of the fornix. A bandage is applied, and after five or six days the base of the flap is cut along the ciliary margin. The same process is available for the upper lid, in which case the flap is prepared on the lower one. Hotz in 1893 advocated Thiersch's skin grafts as a substitute for conjunctiva in symblepharon, in trachomatous shrinkage, and in certain cases of pterygium. Drs. Chambers and Marple in 1898 reported also good results, having immobilized the grafts by means of ordinary buttons surrounded by gauze. Chas. H. May in 1899 used porcelain shells on which he distended the epidermic grafts, and after having inserted the same between the separated lid and the orbital tissues, he closed the lids with sutures. Abadie in 1903 reported a case of extensive symblepharon cured by separating the adhesions, covering a good sized artificial eye with a large Thiersch's skin graft and keeping it in place with sutures passed through the margins of the lids. Abadie says that the idea was suggested to him by Dr. Elliot, an English military surgeon of India, who, while on a scientific tour through Europe, had seen the operation performed with splendid results in the Eye Clinic of Dr. Hansen-Grut, of Copenhagen.

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*Read before the Rhode Island Ophthalmological and Otological Society, December 8, 1910.

The epidermic grafts are prepared as follows: A day previous to the operation the inner side of the arm or thigh should be cleansed, and a bandage of sterilized gauze applied. Just before the operation the skin is washed with soap and sterile water, then rubbed with ether, and kept wet with sterile saline solution. On the parts made tense by means of retractors, a piece of epidermis is shaved off with a razor from which it is immediately transferred to the artificial eye with the raw surface externally, taking special care to spread it evenly and smoothly. The graft must be larger than the surface to be covered to allow for the shrinkage that takes place.

I have performed four operations according to this method in cases of cicatricial orbit, to allow the insertion of an artificial eye, and although not successful in all of them, I can say that, when properly executed, it gives the best and most permanent results.

Case 1. A French Canadian woman, about 45 years of age, came to the R. I. Hospital to be treated for a specific iritis of the left eye, which soon transformed itself in irido-cyclitis with complete occlusion of the pupil, followed by phthisis bulbi. The eye was enucleated, and an artificial one was worn by the patient for one year only, the lower cul-de-sac having become contracted, evidently from irritation of the rough margins of the prothesis. With the usual antiseptic precautions, an epidermic flap was cut from the inner side of the thigh, stretched on an artificial eye with the raw surface outside, applied between the lower lid and the orbit and immobilized by sutures passed through the margins of the lids. The results were good and permanent, as observation for two years has proved.

Case 2. A young woman, aged 25, had lost the right eye in her infancy from unknown causes, and 12 years ago it was enucleated at the R. I. Hospital. She took improper care of the prothesis, which she used to wear for months without removing, until two years ago the conjunctiva having become hypertrophied and the cul-de-sacs effaced, it could not be retained any longer. A socket was attempted once or twice by other physicians by transplanting skin flaps with only temporary and partial success. When I first saw her she was wearing a small artificial eye, her lids were widely separated, could not be closed, and the orbital cavity was nearly filled with cicatricial tissues. The left eye, probably from irritation, had also become affected: the pupil was irregular, adherent in part to the capsule, not dilatable with atropine, and the vision was very much diminished. The patient persistently asked to be operated, and, under general anesthesia, after extensive separation of the lids from the orbital tissues, a rather small artificial eye was inserted between the separated parts, and covered with an epidermic graft taken from the inner region of the thigh. After removal of the glass eye the orbital cavity became rapidly occluded with new-formed tissue, so that no prothesis of whatever size could be worn.

Case 3. A boy 9 years of age, presented the appearance of a patient who had been subjected to enucleation of the right eye, but a closer inspection revealed a very small atrophied eyeball hardly perceptible in the orbit. These conditions, as far as could be learned, had existed since his first years of life. An artificial eye could not be introduced into the orbit, the lower and the upper fornices being much reduced, especially the former. For the correction of this defect an operation was performed at the R. I. Hospital with only a partial and temporary result, for the patient wore a very small eye shell for a month only. I performed the second operation by grafting an epidermic flap distended on a glass eye which was immobilized in the deep artificial cul-de-sac with sutures passed through the margins of the lids. The result was fairly good. The same small prothesis is worn by the patient after eight months, the cavity of the orbit has remained unimpaired, and the graft appears now like a white, smooth, delicate membrane. I can well perceive now that the lower fornix ought to have been made deeper, and a papillomatous growth, which was at the bottom of the socket in front of the small eye, excised.

Case 4. C. B., a man 40 years of age, was badly injured by the blasting of a rock, and was brought to the R. I. Hospital, where, a few hours later, the right forearm was amputated and the left eye enucleated. After cicatrization, it was found that the upper and lower cul-de-sacs, especially on the temporal side, were occluded by cicatricial tissues, for which no prothesis could be worn. In order to restore a socket in this cicatricial orbit, the patient was readmitted to the hospital and operated under general anesthesia. The adhesions were carefully cut, the parts separated as deeply as possible, and canthotomy performed to allow the insertion of a large reform eye between the lids and the orbital cavity. The glass eye was covered by a Thiersch's skin graft taken as usual from the internal region of the patient's thigh, and kept immobilized in the new cavity for seven days, with sutures passed through the margins of the lids. The results of the operation were splendid; the patient was able to wear a good sized prothesis, and looked very well. As the accident happened ten months ago, and the skin grafting was performed eight months ago without the least alteration on the surface of the new cavity formed, we may well admit that the good results were permanent.

Of these four cases, only the second one, as we have seen, was a complete failure. We can account for this when the several previous operations are considered. The previously transplanted tissues should have been taken away, and the whole denuded surface with the cul-de-sac made as deep as possible, and covered with one or more epidermic grafts, instead of a simple separation of the lids from the orbital tissues, and the introduction of rather small graft.

Although I have had no experience with the other methods of treatment, which I have already in brief enumerated, I think that the last one with Thiersch's skin graft, is the best if properly performed. In transplanting regular skin flaps from distant parts, or from the regions near the eye, sutures must be carefully applied to keep them in the new position, a thing not very easy to accomplish, and much ingenuity exercised to fill up the wound on the skin around the eye where more or less deformity will follow. The keeping in place of conjunctival flaps is even more difficult, if we consider the cavity in which we must work, after having accomplished the thorough separation of the adherent parts in the orbit. Epidermic flaps, on the other hand, do not require any sutures, they are very easy to manipulate, are easily distended on the artificial eye, which acts like a support, and can be introduced without any trouble at all between the lids and the cavity of the orbit. The epidermic skin grafts, if successful, remain always smooth, do not proliferate on their external surfaces and, being very thin, they substitute very well the conjunctiva.

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A MODIFIED PTERYGIUM OPERATION.

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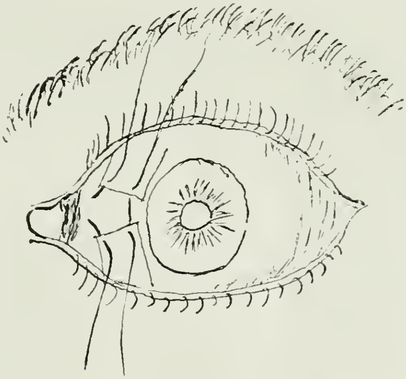
The first step of the operation is performed exactly after the manner suggested by Prof. H. Knapp—i. e., careful dissection of the growth from the cornea, being sure to remove all, down to the true corneal tissue. The growth is then dissected away, and undermined deeply. The head, or the part that was adherent to the cornea, is cut off, and the remainder turned under with a double ended suture—both needles passed from without, inward through the apex of the growth; then deeply near the caruncle from within, out. When this suture is tied, the raw surfaces of the pterygium are in apposition, and heal together. The covering of the denuded surface is next in order, and is accomplished in the following manner:



Pterygium Operation (Wing).

The conjunctiva is dissected from the eye-ball, both above and below, to form a flap as large as necessary.

The diagram shows the situation of the flaps.

The placing of the sutures is the important part of the operation, its aim is to keep the conjunctiva from overriding the denuded cornea, and also to keep the flaps spread out.

and fixed to the raw surface of the episcleral tissue. The first suture is passed through the upper and lower flap, next the cornea, and slightly drawn, but not permanently, tied. The second suture is passed through the upper flap, nearer the canthus from without inward, then through the tissue of the eye-ball over the internal-rectus muscle; then through the lower flap, from within outward. The sutures are then as shown in the diagram. When they are tied, the flaps are spread out, fixed to the raw surface, prevented from overriding the denuded cornea, move with the eye, and readily heal to the denuded episcleral tissue.

THE OCULAR SYMPTOMS OF INFANTILE SCURVY.*

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The ocular symptoms mentioned in connection with scurvy are optic neuritis, retinal hemorrhage, ecchymosis and edema of the lids, ecchymosis of the conjunctiva, chemosis of the conjunctiva, hemorrhage of the conjunctiva, nyctalopia and exophthalmos.

Of these symptoms, exophthalmos *alone* is peculiar to infantile scurvy. Optic neuritis and retinal hemorhage, so far as I know, have never been observed in infantile scurvy, but the only record I can find of an ophthalmoscopic examination having been made is in one reported by Spicer. He examined a case with marked exophthalmos in Nettleship's clinic; "no retinal hemorrhage was observed, but a good view of the fundus was not obtained." It hardly admits of doubt that some of Barlow's cases were studied with the ophthalmoscope, and if fundus changes had been present, they would have been noted. In the case herewith reported, three ophthalmoscopic examinations were made, two under full mydriasis with negative findings, ten days intervening between the examinations.

That a condition sometimes happens in infantile scurvy that might well give rise to an optic neuritis is shown in two postmortem examinations made by Sutherland, in each of which he found extensive hematomas of the dura mater. Barlow also reports finding an old extensive hematoma of the arachnoid in an infant who had had a previous attack of this disease.

Thomas Buzzard in his article on Scurvy in Reynolds' *System of Medicine*, says, "In some cases, often early in the disease, the eye and its surroundings are the only parts exhibiting signs of scurvy. The appearance then presented is very remarkable." Quoting from Bird on Scurvy, the following description is given: "The integument around one or both orbits is puffed upon into a bruise-colored swelling. The conjunctiva covering the sclerotic is tumid, and of a brilliant red color throughout. The limbus is elevated about an eighth of an inch above the cornea, leaving the cornea at the bottom of a circular trench or well. There is nothing inflammatory about the condition, it resembles very violent ophthalmia in the color presented, but there is no pain or discharge. We have seen many cases in which this appearance, together with pallor and listlessness, constituted the only evidence of scurvy, and they have generally been of the most serious character, often terminating fatally."

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*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, March, 1909.

This is the description of the ecchymosis as it occurs in the adult. In the infant there is generally swelling of the lid and marked ecchymosis described in case histories as "black eye." Ecchymosis of the bulbar conjunctiva is generally absent, or present only in a slight degree, never approaching in severity that which so often follows whooping cough. Chemosis of the conjunctiva, often observed in adults, as far as I know, has never been noted in infantile scurvy.

Ecchymosis of the lid with pallor may be the only symptom of scurvy in an infant.

Dr. Cheyney, of San Francisco, says. "A black eye coming on in an infant without traumatism and perhaps repeated several times, can rarely be due to anything but scurvy." Spicer thinks that a slight staining of the skin along the upper ridge of the orbit is often overlooked.

There is such a paucity of literature on ocular symptoms of scurvy, and of infantile scurvy especially, by ophthalmic surgeons, and few of the systematic writers refer to them, so that one is obliged to turn to the pediatrist for nearly all his knowledge concerning them. Exophthalmos (as a symptom of infantile scurvy) first brought to the attention of ophthalmic surgeons by Mr. Holmes Spicer in 1891, finds slight mention in American text books on diseases of the eye. Bull, in Norris and Oliver's *System*, said, "Spontaneous hemorrhage into the orbit is very rare, and when it does occur, it is due to hemophilia, scurvy, diseases of the walls of the blood vessels, or sudden forced muscular action as in violent coughing or retching."

Jackson in a paragraph on purpura, says, "that a sudden hemorrhage into the depth of the orbit causes exophthalmos in purpura and scurvy, but very few cases have been reported."

Barlow in his "*Bradshaw Lecture*" on the subject, states that at "some time in the disease there may occur a remarkable eye phenomenon." There develops a rather sudden proptosis of one eye-ball with puffiness, and a very slight staining of the upper lid; within a day or two the other eye may present similar appearances though they are apt to be of less severity. The ocular conjunctiva may show some ecchymosis or be quite free.

In Barlow's article in Keating's *Cyclopedia of Diseases of Children,* under cases with post-mortem verification, one is shown as having been made upon an infant 10 months old, who had had ecchymosis of both upper lids and proptosis of the left eye-ball, the proptosis having subsided eleven days after its appearance, and the child dying three weeks after first being seen. In the summing of his post-mortem findings, the following statement is made, "The writer believes he has evidence that the proptosis which was present depended also upon a bone lesion, to wit: Extravasation of blood between the orbital plate of the frontal bone and its subjacent periosteum, this extravasation tending to push down the eye-ball."

Later, in 1894, in his *Bradshaw Lectures,* he is more positive. Here he states, "The proptosis is caused by a blood extravasation into the easily distended space between the roof of the orbit and its periosteum. This is facilitated by the looseness with which in the normal condition the periosteum is attached to the bone on the under surface of the roof of the orbit."

Spicer observes that the periosteum is only attached at the margin of the orbit, and that it is almost impossible to open the orbit from above with the periosteum remaining attached to the bone, that, indeed, it behaves like, and is more the character of a membrane enveloping the contents of the orbit.

There can be no doubt that this is the true explanation of the symptom when it occurs, but why it never happens practically after the first year of life, no one has assayed an answer, and a plausible explanation would be hard to advance.

In all the case histories that I have been able to examine, where the condition is not described as a protrusion of the eye-ball, it is noted as a proptosis with the eye-ball pushed downward and forward. In 1892 Holmes Spicer reported three cases of proptosis in infants 7, 8 and 9 months old respectively. In two of these there was a slight muco-purulent discharge, but he states that in one case there were four other children in the family recovering from catarrhal ophthalmia.

The exophthalmos is in no way dependent on the severity of the case, being often present in light cases and absent in serious ones, and vice versa. According to Osler's *Twentieth Century Medicine*, exophthalmos is said to occur in 10% of the cases of infantile scurvy. Barlow encountered it seventeen times in sixty-four cases, almost 11%. In the thirty-six cases analyzed by Northrup in 1891, exophthalmos is not mentioned, although two had "black eye." In sixteen cases reported by Griffith in 1891, this symptom is not mentioned. In the 379 case histories reviewed in *The Collective Investigations of Infantile Scurvy in North America,* by the American Pediatric Society, it occurred forty times.

Under appropriate treatment, the exophthalmos rapidly diminishes and the eye becomes normal. Spicer contends "that although in a few days the eye may almost have resumed its normal appearance, due to an absorption of the fluid parts of the extravasation, that complete absorption does not take place, and that after a long interval, the eye is somewhat prominent, and that it is not certain whether the eye ever regains its normal position." He cites one case in which seven months after discharge, there was a notable fullness of one eye.

The rarity of the symptoms in this disease probably justifies its discussion rather than otherwise, especially in view of this statement by Barlow, "Of seven of my cases in which orbital hemorrhage occurred, four presented the orbital symptoms before the limb symptoms, and in some of these the limb symptoms were slight, there being great local tenderness, with much irritability, but little swelling." From this it would appear that especially in large medical centers, the ophthalmic surgeon is more than likely to first see the case. Holmes Spicer, after dwelling on the sign of orbital hemorrhage generally being associated with other scorbutic signs, cites this hypothetical case: "That in a case of a hand-fed infant aged seven months with proptosis and no other scorbutic symptoms, I consider a diagnosis of scurvy justifiable." Regarding this, Barlow thinks it rather a difficult doctrine to accept, but believes it to be sound.

The youngest age at which I have found exophthalmos reported is six months, of which there are several, and the oldest is one of thirteen months, reported by Dr. S. M. Wier.

Barlow and most other writers contend that the swelling and bleeding of the gums only occur when teeth are present, so that in many of their young patients this valuable symptoms is likely to be absent as an aid in diagnosis. This has been especially so in England where rickets has so often been found associated, however, this cause of delayed dentition is not so likely to be met with by ourselves.

In contradiction to Barlow's position, the collective investigation of the American Pediatric Society reports that 45 cases out of 379 were without teeth, and that of these 21 had no gum symptoms and 24 had swelling and bleeding of the gums. In support of Barlow it may be said that all the older writers on scurvy agree that in persons who by age or otherwise had lost their teeth the characteristic gum symptoms were wanting.

The disease is more frequent in private than in hospital patients; amongst the very poor it is very uncommon, of the thirty-three cases seen by Barlow between 1883 and 1894 six only were hospital cases, the others being children of well-to-do people, with healthy surroundings and good homes.

Of the 379 cases in the collective investigations of the American Pediatric Society, 83% were from private practice.

Barlow observes that among the well-to-do there is an increasing difficulty in getting the mothers to suckle their infants, and that there has been an enormous increase, both in England and America, in the employment of proprietary foods. The expense of these deters many of the poor from their use.

But as an offset to this, condensed milk is extensively used by the poor. That this does not oftener cause scurvy is accounted for by Cheadle in that potatoes form so great a part of the food of the poor, and that children of this class are given table food at a much earlier age.

There is such a dearth of literature on the subject by ophthalmic surgeons, that I hope I may be pardoned for referring in a brief manner to the history of infantile scurvy and scurvy in children, in order to credit a priority of observation.

The early history of the disease is briefly summarized by Dr. H. M. McClanahan, and hardly allows of any improvement.

"The credit of giving the disease a distinct place in nosology belongs to W. B. Cheadle, of London, who described three cases in the *London Lancet* in 1878 as true scurvy. Previously to this, isolated cases had been noted in Germany by Moeller, Bohn, Hirschsprung and Senator as examples of acute rickets, and one case in Sweden by Ingelver in 1873 as infantile scurvy. The first case recorded in England was in 1876 by T. Smith and called by him hemorrhagic periostitis. Similar cases are described by Dr. Gee under the name of periosteal cachexia. In 1883 Barlow in the *Medico-Chirurgical Transactions*, gave the history of eleven cases under his care, and twenty from other sources. He also gave very fully the morbid anatomy of infantile scorbutus."

In the above description the very important case of Immerman in 1876 is overlooked, as is also the earliest mention of scurvy in childhood that I have been able to find. Prof. Rosas in his *Handbook der Augenheilkunde*, published in Vienna in 1830, reports a case observed by him in 1823 of hemorrhage from the lacrimal gland in a child 9 years of age of scorbutic diathesis, and in whom it yielded to antiscorbutic treatment. McKenzie in his *Practical Treatise on Diseases of the Eye*, published in 1840, commenting on the case, considered it more probably a hemorrhage from the conjunctiva.

My own case is as follows: October 7, 1908, J. W., aet. 11 months, was referred to me by Dr. Williams, of Lambertville, N. J., for its ocular trouble, with the request that I should have some member of the staff of St. Francis Hospital examine his general condition with the hope that they might suggest some line of treatment.

Two weeks before this, the left eye-lid was considerably swollen, but had almost subsided, until three days before the examination, when the child had a violent crying spell lasting half an hour, after which the eye-ball protruded and the eye-lid became very dark. Right leg broken and in splints (doubtful history of violence).

There was marked exophthalmos of left eye, and left eyelids were black and blue, some ecchymosis of bulbar conjunctiva to nasal side. The eye-ball, as in nearly all cases reported, was pushed outward and downward, and motion was somewhat retarded. Ophthalmoscopic examination with undilated pupil was unsatisfactory. In the absence of a consultant, a general examination was not made on this date.

A few days later, in consultation with Dr. F. V. Cantwell, the diagnosis of Barlow's disease was made, and a diet of raw cow's milk, orange juice, baked potatoes and beef juice advised.

The case was seen by Dr. Cantwell and myself on October 14th. On the 12th there had been an edema of the other lid without any discoloration, and this was followed two days later by proptosis with slight ecchymosis of lid.

The following history was taken at this time: Father and mother healthy; mother has had six children, oldest died at 13 months of age of cholera infantum; second child is ten years of age and healthy; third child had whooping cough for thirteen weeks and died at three years and seven months of age. Mother thinks he had same trouble as this child, because one leg was larger than the other, and the gums were very bad; fourth child still-born; fifth child died at eight months of age of cholera infantum.

Mother's father was a sailor in the Chinese trade and was drowned at sea. Dr. Cantwell was inclined to lend some importance to this, claiming that nearly all sailors at that time had scurvy at some time or other, and believed he had established a family history of scurvy in one other case of infantile scurvy which had come under his observation.

So far as I know, this is the only claim for a hereditary tendency to the disease, unless Immerman's case reported in 1876 might be considered such. The case reported by him, a scorbutic mother nursing a child, the infant developed scurvy. This is also the only case reported of a child breast fed having scurvy.

Mother's mother and sister living. Father's family history negative. The child had been fed as follows: For two weeks diluted cow's milk; at the end of two weeks Eskay's food was given for two weeks; constant vomiting; Attenbury's food for two weeks, not retained; Mellin's food for two or three weeks, at first seemed to agree with the child. Imperial Granum for two weeks; Nestles' food for several weeks, and for the last three months has been fed on Malted Milk.

The physical condition of the child was noted at the time as follows: Two central incisors, upper and lower, are present, with a granular strawberry protuberance around them. This does not bleed on being rather roughly treated with a pledget of cotton on applicator. Left hip large, marked swelling, very tender but no redness. Left knee swollen twice the size of its fellow, tender but no redness; in the left leg there is a large brawny lump looking like a bad cramp of the muscles. There are two small lumps in the right leg, the right thigh is swollen, but looks small compared with the left one. There are lumps just above both wrists, and both scapula are prominent. Mother states that in the last couple of months there have been other lumps that have come and gone. Right tibia and fibula are fractured (probably separation of epiphysis) near the ankle.

Marked exophthalmos of left eye with ecchymosis; some conjunctival hemorrhage, and slight exophthalmos of right eye, and slight ecchymosis of lids; pupils react to light. Ophthalmoscopic examination after use of mydriatic showed no hemorrhage in the fundi.

Child cries constantly and dreads handling. Mother states child has cried almost incessantly for weeks. Has not moved its legs for last two months. Not only extreme pallor, but child is chlorotic, has the appearance of one a week old, is emaciated except that swelling in the lower part of body makes it look plump below waist line. There have been alternating periods of diarrhea and constipation depending somewhat on the changes in the food. Neither at this time, nor at my first examination, was there any fever. Child drivels blood and at times has vomited it quite freely; mother is sure it was not from the gum or mouth. Has had black stools at times.

The child was again seen on the 19th day of October, five days after beginning an antiscorbutic diet. Both Dr. Cantwell and myself expressed ourselves as having never seen such a remarkable change in a case. The proptosis in both eyes had almost susided, the ecchymosis of the lids had certainly disappeared far more rapidly than could be expected from the slow absorption we see in traumatic cases. The swelling of the left knee and hip had diminished at least one-half, and the mother states he had voluntarily moved his legs for the first time in months.

Here I believe the history of the disease properly ends, as it will in nearly all cases with the adoption of an antiscorbutic diet. Barlow, after reviewing the diagnostic symptoms of scurvy, adds that the most important diagnostic of all is, "the definite and rapid amelioration by an antiscorbutic regimen."

On the 27th day of October the child was seen, one year of age on this date, and weighed a little less than eleven pounds, but outside of its diminutive size, there was no sign of disease.

The fracture had healed and seemed as firm as the other leg. Child could be handled without crying and there was not a suspicion of any exophthalmos.

March 19th, 1909, child was at office, a large, healthy, good-natured baby.

1436 Diamond Street.

CONCERNING ELEPHANTIASIS OF THE EYELIDS.

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NEW YORK CITY.

When the name elephantiasis is mentioned we at once associate with it the filaria sanguinis hominis. The cases of elephantiasis affecting the lower extremities or the scrotum are always due to the presence of this parasite. This has been so well established that there no longer remains room for discussion. The same, however, cannot be said of elephantiasis of the eyelids. Here we are apparently dealing with a manifestation of this disease affecting new parts, but in which it has been impossible to show the presence of the filaria in the blood. We must, therefore, produce some new reasons for our belief that we are dealing with a true hyperplasia of the subcutaneous and lymphatic tissues. It was Bouillard, in 1830, who suggested the classification of elephantiasis as follows: Elephantiasis of the lymphatics and elephantiasis of the veins. This was a new thought, and later, when the results of the studies of such men as D'Alchalme, Roger, Gaucher and Sabourand were published we were more convinced of the truth of Bouillard's claim. These men had studied this condition from its many sides, and when our attention was directed to the number of different manifestations of the streptococcus on the skin surface, then it was that we were led to associate erysipelas with elephantiasis of the eyelids. Subsequent studies and observations have tended to confirm this claim in many cases, but at the present time there is no explanation which is sufficient to explain satisfactorily the pathogenesis of the disease.

Critchett reports a case of solid edema or elephantiasis in the *Trans., Ophthal. Soc., U. K.,* Vol. XIX, from which I have made an abstract. Woman aet. 22; enormous swelling of both the upper and lower eyelids. Had an attack of erysipelas seven years before. Swelling had been present for three months when the case was first seen. The following treatments had been tried: Multiple punctures with the electric needle, silver nitrate, collodion, pressure and fomentations; all with no benefit. Later, excision two or three times, with good results following for a time, but not lasting. Family and personal history negative. Critchett was of the opinion that the process was limited to the cellular tissue. Eyres has seen a number of these cases extending over a period of seven years, and he thinks that the upper lid is more often affected.

Brailey states that he has operated on several cases. He removed the tissue from the lower lid in his cases, and the results were satisfactory for more than a year. He also inclines to the belief that the history of recurrent attacks of erysipelas is often obtained in this disease.

In 1898 Holmes Spicer reported a case in a boy of 13, with swelling of the lids that remained unchanged after a year. The swelling was in both the upper and lower lids, the skin being smooth and distended. There was also an edema of the ears. Treatment was lotions, iron, iodides and arsenic, with no improvement following.

There are those who believe that the condition is due to a lymphangitis, and Morris has suggested the possibility of lupus as an exciting cause.

Etiology.—This condition, which is known as elephantiasis or edema of the eyelids, is not often met with in our private or clinical work. It is usually seen in persons between the ages of 15 and 22, and has been seen before 8 and after 54. It is more often seen in females, the proportion being two to one, for no special reason, as far as we are able to determine. The swelling is usually bilateral, but there have been cases reported in which it has affected one side only. More often seen in all four lids, it is frequently seen in the upper lids alone. As far as the influence of heredity is concerned in this disease, we have not been able to conclude that it is to be considered as a positive factor. Nor can we attach any importance to a syphilitic diathesis. Lupus has been mentioned by Morris as a possible cause in some of the cases. There have been several cases reported where there was lupus present in the skin of the face. Traumatism, if it be severe enough to cause laceration of the skin, and if associated with the introduction of streptococci, may be followed by elephantiasis, but, as a rule in such cases, an attack of erysipelas has ensued first. The trauma in itself is not enough to produce a true elephantiasis.

Still another possible factor may be the presence of some general disease, as chlorosis, anemia or leukemia. Recurrent attacks of lymphangitis have been mentioned, and some authorities think that this is the real explanation for the disease. From my studies of this condition, I am led to believe that there is no one cause that will satisfactorily explain all of the cases that have been reported so far.

Diagnosis.—In elephantiasis of the eyelids we have a hyperplasia of the subcutaneous tissues, and it gives a sensation of elasticity to the palpating finger. The surface of the skin is usually smooth and tense. It is not difficult to diagnose this condition from papilloma of the lids or from hyperplasia affecting the tarsus. The erectile tumors of the eyelids are usually composed of veins, and they are generally to be seen by the eye of the observer, and furthermore, the palpation of such tumors will give the sensation of a mass of earth worms to the finger. Sarcomas affecting these parts would not be so rapid. We often have pain with sarcoma, and the extension to other parts, with dyscrasia. One must also bear in mind that we have lipomas and fibromas affecting the tissues of the lids. Transillumination may serve as means of confirming our diagnosis.

Treatment.—This disease is not a recent one, as we find that the ancients treated this condition. They generally practiced excision. The English ophthalmic surgeons still believe in this form of treatment and use it more often than any other method.

The local application of electricity in the form of the faradic current has met with favor in the hands of some men, but the general results have not been permanent. Silva Oranje recommended this first in 1877. He argued that the stimulation of this current would cause absorption by its action upon the lymphatics and blood vessels. The X-rays have been tried, but no good results can be claimed for them, and this has also been the case where the high frequency and the violet rays have been used.

The use of the electric needle, making multiple punctures into the subcutaneous tissues of the lid, has given the best results of any form of treatment that we know of. Electrolysis is produced, and a secondary decomposition of the subcutaneous tissues is supposed to take place, due to the galvanic current, the effect depending upon the pole used.

Boute recommends a battery charged with the dioxide of manganese and the bisulphate of mercury. The advantage claimed for it is that it can be charged by oneself, and used ten minutes after charging. He thinks that in the use of such a battery one should always use a galvanometer. He thinks that the positive electrode is the best. He inserts the needle deep into the tissue, and the negative electrode is held in the hand. It may require from ten to fifteen seances before the swelling is entirely destroyed. (*Theses, Facultie de Medecine*, 1900.) Begonie and Larat both think that the reverse of the above technic gives the best results.

D'Apostle used a crown of needles which were positive at the periphery and negative in the center, using 5 to 10 milleampers for five minutes.

Pagenstecher has tried to cure this condition by the use of an operation which was performed in the following manner: He takes a thread with two needles attached and, entering with one at the base of the swelling in the eyelid; the second is inserted about four mm. from the first at the same relative position, both needles are brought out at the lower edge of the eyebrow and fastened over a small piece of gauze.

Dransart uses about the same technic, only he reverses the manner of placing his sutures—i. e., enters at the brow and comes out at the base of the swelling. The suture is supposed to set up an inflammatory reaction of the subcutaneous tissues of the eyelid, and this is followed by cicatrization and contraction.

62 W. 58th Street.

PAPILLOMA OF THE CONJUNCTIVA.

Frederick Krauss, M. D.,

Philadelphia.

Papilloma is one of the rarest growths observed in the conjunctiva. It may be described as a polypoid growth, with a narrow or broad base, a cauliflower like surface, and of a fibro-papillomatous structure microscopically. Elschnig in a classification of polypoid growths of the conjunctiva divided them into four varieties. In the first he includes soft fibromata, which have a tendency to cause severe bleeding. They are usually small and are situated generally on the palpebral conjunctiva. The second class includes the hard fibromata, which usually arise from the palpebral conjunctiva, but may also arise from the caruncle. They show no tendency to bleed nor to recur after removal. The third variety includes the papillomata, and the fourth the adenomata.

The rarity of papilloma of the conjunctiva is demonstrated in a careful study of the literature by Velhagen, in 1904, which resulted in the collection of ninety-five cases reported by sixty authors. In some of these no microscopical examination had been made. Three cases, reported by Johnson in 1903 and 1904, are not included in this series.

In sixty cases collected by Velhagen it occurred most frequently in males, and in the sixth decade of life, namely, in fourteen instances, with the seventh decade following with twelve cases, and the fifth decade coming third with nine cases.

The size of the growths recorded varied between that of a bean and that of the hazelnut. Of seventy-four cases gathered by him, fifty-six were solitary growths and eighteen were multiple. Of the solitary growths—

18 were situated on the corneal limbus.
13 were situated on the caruncle or plica semilunaris.
10 were situated on the palpebral conjunctiva.
8 were situated on the bulbar conjunctiva.
5 were situated in the fornix.
2 were situated in the outer canthus.

The three cases of Johnson were situated near the sclerocorneal junction.

The etiology is obscure. It is usually supposed to follow some slight traumatism, but as there are very many traumatisms of the conjunctiva and few papillomata, it is evident that there is some second factor not yet discovered. Several cases have been reported as following an operation for pterygium. Two cases have been reported of small papillomata due to peculiar blastomycetoid organisms introduced into the eye by a slight traumatism. They were rapid in growth and had a smooth surface. This would suggest a possibility of infection in other cases. The pathologic findings in the case recorded below have not demonstrated such a condition. In regard to prognosis, it must be remembered that a marked tendency to recurrence has been observed in many cases. Also, that a number of cases showing a tendency to carcinomatous change has been reported. Thorough removal is of the utmost importance, although in the case reported by Fuchs the growth recurred despite the fact that the patient had entropion, partial symblepharon, adhesions and lagophthalmos following operation.

Case: Mr. A. Y., male, 47 years of age, a manufacturer, was referred to me in February, 1910, by Dr. R. H. Harris, of Elkins Park, on account of a growth of the left eye.

The family history is negative. The patient had an attack of iritis five years ago, probably rheumatic in origin. Otherwise he has been well. For fifteen years he has noticed a small sand like growth on his upper lid, causing at times the sensation of a foreign body.

The growth was very slight and caused him no inconvenience. There was no history of traumatism. After the attack of iritis, the tumor grew with greater rapidity, and especially so within the past year, so that at times it was perceptible without turning the lid, but the patient was able to replace the same without inconvenience.

Within the last few weeks it has grown to such a size that he can no longer replace it, and he now seeks to have it removed. He wore a black patch to hide the growth, which was projecting between the lids. His ocular condition was as follows:

The right eye was normal without evidence of any growth.

The left eye presented a remarkable appearance. Projecting from between the lids was a large growth, bright red in color, papilliform and with numerous raspberry like papilla covering its surface.

It was insensitive to touch, and presented no spots of ulceration. The upper lid was proptosed, held partly everted, and firmly closed by the tumor. Upon effort, the tumor was replaced sufficiently to allow the upper lid to be opened. The tumor filled the center of the palpebral fissure, completely hiding the cornea

It was attached by a narrow and rather short pedicle to the conjunctiva in the middle of the upper edge of the cartilage of the upper lid, extending slightly into the fornix. The growth was of the size of a large cherry and of rather firm consistency. The measurements were approximately one inch by three-quarters of an inch. It was somewhat conical in shape.

Upon excision, the base of the tumor was found to be firmly attached to the cartilage over rather an extensive area, so that the wound left after its removal was fully one-half inch long. The edge of the cartilage was included in the excised portion to prevent recurrence if possible.

Aside from a few narrow synechiae, and pigment spots on the lens, indicating old iritis, the eye was normal.

In the affected eye there was a marked catarrhal conjunctivitis, probably due to the irritation of the tumor, as it promptly cleared away after use of an antiseptic and slightly astringent wash.

The growth was placed in alcohol, and later in 10 per cent formalin, then sectioned in paraffin, after going through the usual course, and stained with eosinhematoxylin. The microscopic findings were kindly elicited by Dr. Allen J. Smith, whose report follows:

"Section of conjunctival growth submitted for examination by Dr. Krauss shows the general structure of a papilloma. It is stated that section was made in the flat plane of the growth, evidently from the size of the sections (10x7 mm.) being taken from near the top of the mass. It consists of a central mass of fibrous connective tissue, comparatively loose in texture, and containing numerous young fibroblastic elements, from which papillary projections extend at the border, at places of digitate shape, and fringing out from the periphery, at other places thick and loose, separated by clefts into which the surface epithelium extends as a covering of the depressions. This is covered by a stratified epithelium, evidently of squamous type. but rather of transitional form, as the surface cells are thick, protoplasmic, nucleated, and rather pyriform in shape. The deeper cells quickly become of cylindrical form as one proceeds from the surface. The thickness of the epithelial layer varies very much, from only two or three strata, to six or eight or more. Here and there, large globular cells filled with faintly eosin staining material (probably from overstaining with the eosin) are interpreted by the writer as mucinous cells (mucin ordinarily should stain with hematoxylin) and scattered leucocytes are evident, which have penetrated between the cells of the epithelial covering. Within the connective tissue interior, a large sebaceous gland is imbedded, which in places shows cystic changes, with evident degeneration and necrosis of neighboring cells of the gland. In a few situations active proliferation with extension of masses of these cells into the surrounding stroma has occurred, and in two of these there are appearances of "cell nests," as in squamous epithelioma. The extensions shown in the section are, however, not large, but are clear, from the shape of the sinuses, and from the lack of the granular appearance of the cells, in contrast to the ordinary granular sebaceous cells of unaffected parts of the gland. The stroma is fairly vascular, the vessels small and comparatively well formed. At places dilated lymph spaces form a loose network of the tissue, evidently localized edema. No suppurative foci are to be seen, and there are no appearances of any blastomycetoid organisms present in any situation."

Among the points of interest in this case are:

1. The rarity of the disease.

2. The extraordinary size of a benign growth arising from the conjunctiva.

3. The rather uncommon situation of the papilloma, namely, at the margin of the fornix.

4. The long period of slow or no growth, followed by a more rapidly increasing growth as a sequence to an intercurrent attack of iritis.

5. The possibility of a change of character from benign to

malignant as shown in the beginning changes in the cellular inclusions noticed by Dr. Smith.

The healing in this case was uneventful, and up to the present time there has been no indication of recurrence of the growth.

1701 Chestnut Street.

AN INTERESTING CASE OF GUMMA OF THE BRAIN, WITH ABSOLUTE BLINDNESS AND COMPLETE RECOVERY.

E. Oliver Winship, M. D.,

New London, Conn.

Case of Mrs. S., Westerly, R. I., referred by Dr. May.—Widow, age 32. Lost 34 pounds since having tonsilitis three weeks ago; now weighs 140 pounds. History of severe albuminuria following child birth six years ago, lasting six weeks. Dacryocystitis following measles six months ago.

During the last ten days had pain and soreness in her eyes, and was prescribed for by telephone for conjunctivitis. Sent to me today by Dr. May on advice from her that she was growing worse. Patient was led into office unable to distinguish light from darkness, light perception and projection entirely gone. This condition had been coming on gradually during the last ten days. She is the mother of three healthy children and never had an illness of any kind excepting as above. Denies absolutely, and I believe conscientiously, any specific history.

Eyes were exophthalmic and painful; pupils dilated, but there was slight consensual reaction to light, notwithstanding the fact that light perception and projection were entirely absent. Temperature and pulse normal. Ophthalmoscopic examination showed both disks badly choked and somewhat edematous. Nostrils healthy and no evidence of accessory sinus disease.

She was admitted to sanitarium, put to bed and given magnesium sulphate, potassium iodid and mercury. A thorough physical examination was made and found negative, as was the uranalysis, with the exception of a marked increase of indican. Tuberculin skin test was also negative. The third night she was very restless, and the nurse gave her 1-4th gr. of morphin and 1-150th of atropin. The following afternoon she was delirious—talked at random, knew no one and had a deep red rash over her entire body. Temperature, 103; pulse, 140. Blood analysis made by Dr. Mary Lawson showed leucocytosis —white corpuscles—16,000; polynuclear leucocytes, 75%. These symptoms led me to believe that she had a brain abscess instead of syphilitic gumma, as I had previously diagnosed, notwithstanding the negative specific history.

Her delirium, fever and erythema having disappeared the next day, I sent her to New York, where she consulted Dr. John Wheeler and Dr. John Richards. After a thorough examination, in which they were unable to determine the cause of the neuritis, they called in Dr. Armstrong, thinking there might be some pelvic condition causing a metastasis in the brain—accounting for the neuritis and consequent amaurosis. This, however, proved of no value, and X-ray photographs of the accessory sinuses were taken by Dr. Caldwell. Result negative.

A secondary blood analysis was made at the New York Eye and Ear Infirmary by Dr. Dixon, and contrary to the analysis made by Dr. Lawson two days before, showed the blood to be normal, white corpuscles, 10,200, and polynuclear leucocytes 65.5%. Noguchi negative. Patient had been under potassium iodid and mercurial ointment for three or four days previous to the Noguchi test, which might have influenced the latter.

The patient stood the two days' trip to New York much better than either of the two nurses who accompanied her, but no light was thrown on the etiology nor was a diagnosis made. She was again put to bed and in a week from her return, or ten days from her entrance to the sanitarium, could distinguish light when reflected into her eyes.

The ophthalmoscope showed a slight improvement in her disks, and in fourteen days she was able to count fingers at one foot; no particular field of vision brighter than another. There had been no interruption in her treatment with mercury and iodid of potassium.

In three weeks she had 20-100ths vision in each eye, and in four weeks, 20-60ths; in five weeks, 20-30ths; disks were clearing nicely, and she had gained four and a half pounds. September 15th, or in six weeks, vision was 20-15ths R. and L., she was feeling well and had gained 12 pounds. Exophthamos entirely disappeared. At present writing her condition is the same as when case was dismissed September 15th, 1910.

The case, to me, is particularly interesting in its obscure etiology, the exophthalmos, the transient leucocytosis occurring simultaneously with the erythema, the persistence of light sensation in spite of complete blindness and is very gratifying in the fact that she fully recovered her vision.

29 Union Street.

CONCERNING VERTICAL IMBALANCE (HYPERPHORIA AND HYPOPHORIA) AND THE VALUE OF THE VERTICAL PRISM IN OPHTHALMIC PRACTICE.*

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While hyperphoria is not the most frequent problem confronting the ophthalmic surgeon, it is none the less frequent enough to command his earnest attention and fullest study. William Campbell Posey found 13 per cent. of all his patients showed hyperphoria in some degree. J. T. Carpenter found it present at the first visit in thirty-five per cent. of his private patients. An estimate made nine years ago of 700 of my own private patients showed that 30 per cent. of them revealed hyperphoria of one-half degree or more. A recent estimate embracing 3,600 of my private cases indicates 5 per cent. showing 1 degree or more of hyperphoria at the first visit, and 7 per cent. in whom prolonged study of the case revealed that much hyperphoria. If, therefore, one in fifteen of our patients prove hyperphoric to this degree, the subject is one well worth our consideration. With these figures should be compared those of Bannister, whose investigations on 100 healthy soldiers at Fort Leavenworth disclosed 7 per cent. of them as having vertical deviations. Howe studied the muscular status in 56 soldiers at Fort Porter, among whom he found seven (or 12 per cent.) with hyperphoria. Some time after this Williams and Howe measured the muscle balance in 31 Harvard students and found five (or 16 per cent.) of them with vertical anomalies.

In this connection the contribution of Bielchowski and Ludwig may be mentioned. Their conclusions are that lateral heterophoria was on the whole somewhat more marked among the normal persons examined for control, than among the neurotics examined, but the latent vertical deviations were more frequent among the neurotics than with the healthy individuals. All of which may mean little, or may mean much. Differences in methods with different workers is nearly always the chief factor in producing disparity of results. One fact stands out (and for that matter has long been known) namely, that heterophoria is not infrequent in normal individuals; moreover, hyperphoria occurs in a fair percentage of patients in whom careful refraction alone without any special treatment of the muscle status seems to afford perfect relief. Some people carry a vertical error of 1 degree to 2 degrees all through a life of high tension and large usefulness without any particular discomfort, while in others one-half to three-quarters of a degree is sufficient to make life a burden.

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*An address delivered by invitation before the Buffalo Academy of Ophthalmology, January 20, 1908.

Nature is marvelously elastic in her adjustments; witness, for instance, the fact that, academically, there should be a perfect mathematic relation between accommodation and convergence, diopter for meter-angle. Now, the majority of the human race are hypermetropic in varying degree, and yet nature has established for most persons some sort of relation between their accommodation and convergence that generally suffices. So that the mere finding that an individual has a hyperphoria is of itself nothing until it is viewed in its relation to his or her heredity, temperament, environment, occupation and physical condition. Hyperphoria of 3 degrees in a soldier may easily prove a negligible quantity. Hyperphoria of 1 degree to 1½ degrees in a student, accountant or private secretary may alter their whole career.

Age is by common consent now admitted as one of the dominant factors in the unveiling, if not in the production, of hyperphoria. In the series reported by me in 1900, one-third were below 30 years of age, and two-thirds above that age. The same is true of the series I now report. I have found intrinsic hyperphoria causative of much distress in a child of 12, but this is unusual. As I have said elsewhere, there is no satisfactory explanation for this increase, or perhaps unmasking of a latent hyperphoria. The parallel process of uncovering latent hypermetropia by advancing years naturally suggests itself, and may have much to do with this seeming actual increase in hyperphoria.

The principal symptoms of vertical deviation tendencies, are, supraorbital, temporal and occipital neuralgias (with accompanying hyperesthesia), photophobia, drowsiness, panorama headache, tremendously exaggerated general fatigue and mental confusion after prolonged near work.

To these symptoms may be added the vertigo, transient diplopia (especially on looking downwards), gastric reflexes and mental depression occasionally produced by an uncorrected hyperphoria.

ETIOLOGY.

There are a few facts concerning the etiology of hyperphoria that are known, a few more that are surmised, and a large array that remain obscure and practically unknown. Prominent among the known facts is the occurrence of spurious hyperphoria. The following case is in point: A. W., female, aged 16, comes on account of difficulty in all near work. Much headache, eyes tired easily, general health fair. Vision, R. 5-7; L. 5-9. Accommodation normal. Muscle balance, esophoria 4 degrees, left hyperphoria 2 degrees for distance. No diplopia could be elicited even in the extreme periphery of the binocular fixation field. Under prolonged atropia, the refraction was found to be: R. + .50 S. + 1.25 C. 75 degrees; L. + .62 S. + 1.00 C. 135 degrees, and after one week's use of the atropine and the above correction, the 2 degrees of hyperphoria had disappeared entirely, nor was it in evidence 6 months later when I had opportunity to study the case again. Such cases are not rare.

Another known factor in the production of hyperphoria is congenital paresis of one of the elevators or depressors, most often the superior rectus, as illustrated by the following: V. M. M., female, married, 23, was referred to me by her uncle (who was her physician), on account of panorama headache, also train and trolley nausea and vertigo, so marked that she could not ride more than 8 or 10 blocks in the trolley cars. Use of her eyes for reading and sewing was limited to 15 or 20 minutes, and this in spite of the fact that she was wearing a good correction. She was a tall, thin, poorly nourished girl, hyperesthetic, and on the verge of neurasthenia. Both eyes were normal anteriorly, and with her correction, which was: R., + .50 S. + 1.00 C. 100 degrees; L., + .75 S. + 0.90 C. 80 degrees, vision was full and sharp 5/4 in each eye. The eye-grounds showed the fluffy nerve head and angry chorioid often found with such muscular anomalies. Her muscle status was exophoria of 2 degrees for infinity and 5 degrees for the occupation distance. There was right hyperphoria of 8 degrees for infinity (when the eyes were in the primary position) and 9 degrees at the occupation distance. Search for diplopia in the extreme periphery of the binocular fixation field revealed vertical diplopia with the left image higher in the middle and left upper field, most marked in the left upper field where the separation of the images was about 4 inches. Paresis of the left superior rectus was thus plainly shown. On questioning her I learned that for years she had occasionally seen double when looking at anything far up to the left, but thought nothing of it. So that the apparent diagnosis of right hyperphoria in the case, immediately gave way to the proper one of paretic left hypophoria. It may be stated, in passing, that a 4-degree prism *base up* was incorporated in her left glass and after two years' use of it she can ride 25 miles in a trolley car without the slightest disturbance; she has lost all her headaches and hyperesthesia, and can use her eyes for one and one-half to two hours at near work very comfortably.

The other fact about which we should be on guard is the hyperphoria not infrequently seen in the earliest stages of central nervous disease—tabes and general paresis in particular. For instance, M. A., aged 34, broker, referred by his family physician on account of eye symptoms, showed 4 degrees of left hyperphoria. No diplopia could be shown in any part of the binocular fixation field. There was no other abnormality about the eyes save incipient Argyll-Robertson pupils, which led me to suggest consultation with a neurologist. One year later, without the use of any correcting glass (as he was practically emmetropic), the hyperphoria had disappeared entirely, but the Argyll-Robertson phenomenon was completely developed, and his accommodation was decidedly subnormal.

Principal among the facts we surmise concerning the etiology of hyperphoria are the anatomic build of the orbit, and anomalies in the origin, insertion and size of the ocular muscles. As to the first proposition, the work done by Stevens is of the highest importance, and his contribution to the subject of cranial and orbital conformation as related to the oculomuscular status will stand for all time. Recently I have tried to extend the anatomic idea by measuring the anterior orbital diameters with a pair of inside callipers, taking usually the major and minor diameters according to Toldt. Thus far the information gathered has been of no special significance. I have also been making craniometric measurements to learn if possible, whether the cephalic index is in any way related to hyperphoria. This has been done in two ways: 1st, by means of an ordinary callipers to get the antero-posterior and biparietal cranial diameters, and secondly, employing the hatter's conformateur in the same manner as set forth in my recent communication on "*Family Exophoria,*" before the American Academy of Ophthalmology and Oto-Laryngology. In 15 recent cases of hyperphoria, all the cephalic indices but one fell within the mesocephalic (medium skulled) or brachycephalic (broad skulled) class, but these facts are too meagre to lead to any conclusions.

As to the size, quality and insertions of the ocular muscles in hyperphoria, Howe has well said that not only have no dissections been made to determine these points in hyperphoria, but we have such infrequent occasion to operate on such cases that it is exceedingly difficult to obtain any working data.

Finally, in considering physiologic causes we are face to face with the innervation problem concerning which we can only speculate.

DIAGNOSIS.

This phase of the subject is quite as elusive as is that of etiology. When we say hyperphoria, we use a clinically convenient term. We have not told whether one axis is abnormally high, or the other abnormally low, nor have we implicated any particular one of the elevators or depressors. The fact is that the majority of cases of hyperphoria are diagnosed on a purely empirical basis. Many magazine writers and some text book writers state in a matter of fact way that the tropometer of Stevens will decide which eye is defective in its upward or downward rotation, and thus decide the matter. All of us, of course, earnestly wish there were some ready and absolutely decisive means of making the distinction between a hyper and hypo-phoric eye. In the higher degrees the tropometer often assists very materially, but in the lower degrees (1½ and less) the evidence is frequently conflicting. In my hands Schweigger's hand perimeter has been of much value. For those who do not need glasses, Casey Wood's method of two-letter words moved along the arc suffices. Those who do wear glasses must lay them off during the examination. They are directed to follow the small one candle light of the electric ophthalmoscope along the arc of the perimeter. As control one may watch the tiny image of the light on the cornea, and upon hesitation of the eye in further rotation the behavior of the corneal image will usually betray it. The rotations observed are generally greater than those with Casey Wood's method.

Of one thing I am persuaded, that is, that the upper periphery of the binocular fixation field is not always interrogated for diplopia as it should be. I believe there are many cases of slight congenital paresis of one of the elevators or depressors that escape detection entirely because of omission of this simple detail.

Estimate of the supra and infraduction (or prism super and subduction) is of quite as much value as any other modern method in endeavoring to decide between a hyperphoria and a hypophoria.

The use of the Maddox rod is the refuge of the vast majority of the ophthalmic profession in this country. Stevens' phorometer is a valuable instrument, but it is so much easier for a patient to tell whether a streak passes through a light, than to decide whether two lights are on a horizontal level, that I find the Maddox rod much the surer device. Too, there is the added advantage, that if the hyperphoria appears to be of different amount according as the Maddox rod is placed before one or the other eye, we thus learn that there must be a slight paresis of one of the elevators or depressors; that when the paretic eye fixes, the separation of the light and streak will be greater (answering to the secondary deviation) than when the sound eye fixes. It must be admitted that in some individuals the impulse to binocular vision is so overpowering a thing that they will frequently fuse the light and the streak, thus covering up their muscle error; but if the rod is quickly reversed several times in the trial frame from the vertical to the horizontal position, one is much more likely to break up the strong fusion impulse in such a case and get at the true deviation.

PARALLAX TEST.

The test that will do away with the fusion impulse in any case and get at the real and ofttimes latent deviation is the parallax test, as first advocated by Alfred Graefe and popularized by Duane. The simplicity of the test, the fact that it tests the eyes under the same conditions that they are used all day, and the ease with which it sets aside the fusion impulse, make it one of the most valuable methods in my hands and I almost invariably use it.

Finally, concerning diagnosis, I think we may say that in a goodly number of the cases we can decide whether the visual axis of one eye is too high or the other too low, and that in a goodly other number we are obliged to fall back on the empirical diagnosis of hyperphoria without knowing which is the abnormal axis. No case should be dismissed, however, until all the foregoing tests have been applied.

TREATMENT.

Anyone who is familiar with the literature of hyperphoria for the last 20 years will recall how tenotomy was advocated on all sides as the only treatment for this condition. Doubtful as anyone might be as to the advisability of tenotomizing the lateral muscles, almost everyone agreed that tenotomy was the rational measure for hyperphoria. Slowly but surely the pendulum has swung away from that extreme position, until today it is quite possible that we may be verging on the other extreme.

Doubtless many of the early tenotomies were performed without any further examination than that with the phorometer or the Maddox rod, and doubtless many paretic hypophorias had their higher visual axis lowered when what they most needed was to have the lower visual axis raised. I have personal knowledge of two such cases. In the light of our present day knowledge such surgery is unjustifiable.

For a long time the profession was overcautious in the use of prisms. Many ophthalmic surgeons hesitated to prescribe vertical prisms of a greater strength than one degree or at the most most two degrees strength, and many were they who contended that the prism was but a crutch that must needs be added to from time to time to the great disadvantage of the patient's ocular muscles. In rebuttal of this contention I offer a series of cases of high hyperphoria, all of whom have found great relief in their prism correction. Among them will be found my own case history, which shows that in 1902 I had right hyperphoria of two and one-half degrees, which I had incorporated in full in my right lens. To-day, after seven years' use of it, I have still but two and one-half degrees total of right hyperphoria, and incidentally I may remark that prolonged near work in my study has not only been possible but pleasurable in such fashion as was never my portion during any portion of my career prior to putting on a vertical prism. My secretary today wears the same 3-degree prism *base down* in her left eye that I ordered for her eight years ago, and there has not been an iota of increase in her total left hyperphoria since that time.

A series of cases is hereto appended in every one of which vertical prisms varying from one to ten degrees have been worn with such comfort that tenotomy has not even been thought of. They are arranged in four groups, towit:

Group 1. Comprises seven cases that have not been under observation more than a year, so that no conclusion can yet be reached as to whether the hyperphoria will or will not increase.

Group 2. Comprises seven cases in which no increase of hyperphoria has occurred.

Group 3. Comprises five cases in which hyperphoria has increased.

Group 4. Comprises three cases of paretic hypophoria commonly diagnosed as hyperphoria.

GROUP I.—OBSERVED LESS THAN A YEAR.

Case I.—F. D., 16 years of age, operated for alternating convergent strabismus three years ago (double tenotomy). There was residual strabismus convergens of 20 degrees. He was in sturdy health, but could not use his eyes more than half an hour without marked ocular distress. After an hour's study of the case, six degrees of left hyperphoria were revealed, and 5-degree prism in left eye ordered. Six months later there were but six degrees of esophoria with his correction and but one remaining degree of left hyperphoria; moreover, he was now able to work hard at his studies.

Case II.—Mrs. H. P. H., aged 60, has been wearing a good correction for four years, but her eyes are tired all the time; much neuralgia all her life; highly neurasthenic. Her correction was: R. + 4.00 sph. + 1.50 cyl. 75 degrees; L. + 4.00 sph. + 2.50 cyl. 105 degrees. With this there was right hyperphoria of 8 degrees. No diplopia, perimeter rotations normal. Tropometer same. She was ordered: R. + 4.00 sph. + 1.50 cyl. 75 degrees $\overset{\frown}{\smile}$ 2 degree prism base down; L. + 4.00 sph. + 2.50 cyl. 105 degrees $\overset{\frown}{\smile}$ 2 degree prism base up, with + 2.50 sph. added for near work. This she has worn in an invisible bifocal glass for nearly two years. She is entirely free from head and eye symptoms and enjoys better health than she ever did in her life before.

CASE III.—Miss M. C. R., aged 45, neurasthenic, panorama headache, vertigo and nausea, photophobia, insomnia. Showed nonparetic left hyperphoria of 2 degrees. Supra and infraduction equal. Arc rotations negative. She was ordered: R. + 2.25 sph. + .25 cyl. 115 degrees; L. + 1.75 sph. + .25 cyl. 80 degrees $\overset{\frown}{\smile}$ 1 degree prism base down. For near, add + 1.25 sphere. These she has worn with great relief to her symptoms for a year past.

CASE IV.—Miss S. P., aged 35. Profoundly neurotic; blepharospasm since childhood; neuralgia almost to the point of desperation. Been treated for years by some of the most eminent practitioners and neurologists. Emerged from three months' rest cure about one month ago. With her correction of R. — 3.00 sph. L. — 2.00 sph., vision equaled 5/6 in each eye, and there were 4 degrees of exophoria for infinity with the Maddox rod (and 13 degrees with the parallax test!). Convergence near point = 5 inches. Her left hyperphoria equaled 4 degrees with both tests. The arc rotation showed defective upward rotation in the right eye, but no diplopia could be developed anywhere in the periphery. Left supraduction 3 degrees, infraduction 1½ degrees. She was ordered: R. — 3.00 sph. $\overset{\frown}{\smile}$ 1 degree prism base in $\overset{\frown}{\smile}$ 1 degree prism base up; L. — 2.00 sph. $\overset{\frown}{\smile}$ 1 degree prism base in $\overset{\frown}{\smile}$ 1 degree prism base down. Prism-training exercises also were prescribed. Three months later she stated that her blepharospasm had practically disappeared (after 30 years' habitual spasm), she was free of head distress, and was traveling the country as agent for a New York cloak house.

CASE V.—Miss E. B., aged 47, fine garment maker; obstinate headache, neuralgia, vertigo for several years resisting all treatment. Patient averse to wearing glasses. Vision equaled: R. 5/45, L. 5/22, and with, R. — 2 S. — 1.00 cyl. 125 degrees = 5/5; L. — 1 S. — .50 cyl. 60 degrees = 5/5. With these there is exophoria of 2 degrees for both infinity and reading distance. Convergence near point equaled 2 inches. She had left hyperphoria of 3 degrees with supra and infraduction equal and arc rotations negative. She was ordered: R. — 2 S. — .75 cyl. 125 degrees; L. — 1 S. — .50 cyl. 60 degrees $\overset{\frown}{\smile}$ 1½ degree prism base down. To this + 2.50 sphere was added for near work. These she has worn for four months in an invisible bifocal with complete disappearance of all her trouble.

Case VI.— J. S. A., auditor, aged 48; uses his eyes very hard. General health fair, but is neurasthenic. Much occipital headache. Refraction, R. — 5.50 S. — 1 cyl. 45 degrees = 5/6; L. — 5.50 S. — 1.50 cyl. 180 degrees = 5/6, with which left hyperphoria = 7 degrees. Arc rotations negative; no diplopia. L. supraduction = 5 degrees, infraduction = 2 degrees. He was ordered: R. — 5.50 S. — 1 cyl. 45 degrees $\overset{\frown}{\smile}$ 2 degree prism base up; L. 5.50 S. — .50 cyl. 180 degrees $\overset{\frown}{\smile}$ 3 degree prism base down. For near work, add + 2 S. These he has worn in separate glasses for seven months with perfect relief.

Case VII.—C. A. B., contractor, aged 57. Had chorea in childhood; always been a nervous, restless man. He is one of those great big neurotic bears we occasionally meet with. Smokes excessively; drinks very little. Has worn for two years: R. + .50 S. — 1.50 cyl. 10 degrees; L. — .50 S. — 1.50 cyl. 178 degrees, with a + 3.00 sph. added for near work, but is not very comfortable. I could not improve his refractive correction. For infinity he showed 1 degree exophoria, and for the occupation distance 6 degrees. There was left hyperphoria of 8 degrees, no diplopia, defective upward rotation of right eye. Right supraduction = 1 degree, infraduction 6 degrees. He was ordered: R. + 50 S. — 1.50 cyl. 10 degrees $\overset{\frown}{\smile}$ 1½ degree prism base up; L. + .50 S. — 1.50 cyl. 178 degrees $\overset{\frown}{\smile}$ 1½ degree prism base down. For near add + 3.00 sphere, with which he has been decidedly more comfortable, but he is yet far from complete relief of his symptoms.

GROUP II—SHOWING NO INCREASE OF HYPERPHORIA.

CASE I.—March, 1901. Miss A. W. S., much frontal vertical headache, indigestion, occasional petit mal in the street, agorophobia. Ventral fixation two years previously. Bad family history. Refractive status = R. — 2.50 S. — 1.00 cyl. 150 degrees = 5/5; L. + 0.25 S. — 1.00 cyl. 30 degrees = 5/5. With these exophoria equals 2 degrees for infinity and 2 degrees at reading distance. Convergence near point equals 4 inches. There was left hyperphoria of 3 degrees. Left supraduction 3 degrees, infraduction 1 degree. Arc rotations negative. No diplopia elicited. She was ordered: R. — 2.50 S. — 1.00 cyl. 150 degrees; L. + .25 S. — 1.00 cyl. 30 degrees ○ 3 degree prism base down. To-day, after almost 8 years, there is not one particle of increase in the hyperphoria. For 3 years past she has been doing secretarial work without any ocular discomfort.

CASE II.—June, 1902. Miss E. A. P., teacher, aged 27. Esotropia in childhood corrected by glasses. Headache all through her school days; been teaching 8 years. Nervous breakdown 1½ years ago. Since then nervous, much vertigo, occasional diplopia; intense, overwhelming drowsiness after near work. Tilts her head to the left all the time. Been wearing: R. + 1.75 S. 1.25 cyl. 90 degrees; L. + 1.25 S. 1.25 cyl. 90 degrees. These gave some help to her eyes and head. Under a mydriatic I found: R. + 2.50 S. + 1. cyl. 90 degrees = 5/5; L. + 2.50 S. + 1.25 cyl. 100 degrees = 5/5. With these there was esophoria of 9 degrees, and right hyperphoria of 4 degrees, but nowhere in the periphery could I make her admit diplopia. Arc rotations showed excessive downward rotations left eye. She was ordered: R. + 2.25 S. + 1. cyl. 90 degrees; L. + 2.00 S. + 1.25 cyl. 100 degrees ○ 2 degree prism base up. Seven years later I saw her again and found her esophoria had diminished from 9 degrees to 3 degrees, and her hyperphoria remained at the same 4 degrees she had exhibited 7 years previously.

CASE III.—Dr. H. J. O., aged 30, wearing, R. + 1.25 S. + .50 cyl. 90 degrees; L. + 1. S. + .50 cyl. 90 degrees. With this he had much trouble in near work. No diplopia, arc rotations negative. Left supraduction = 4 degrees. Infraduction

= 2 degrees. Right hyperphoria 2½ degrees. Under a mydriatic he accepts the same sphere, and in each eye a + .75 cyl. 90 degrees. He was ordered: R. + .75 S. + .75 cyl. 90 degrees ⊃ 1 degree prism base down; L. + .75 S. + .75 cyl. 90 degrees. This was in 1902. To-day, 7 years later, his right hyperphoria remains at 2 degrees total, that is, ½ degree less than it was 7 years ago.

Case IV.—October, 1903. Dr. X. Y. L., aged 35, came wearing R. + .50 S. + .50 cyl. 135 degrees; L. + .50 S. + .50 cyl. 75 degrees. This correction had been worn for 8 years For the last three years panorama headache, nervous at times, almost constant occipital dullness. Formerly much diplopia and migraine. Now esophoria 1 degree. No diplopia anywhere in the periphery, arc rotations absolutely negative; left supraduction = 5 degrees. Infraduction = 1 degree. Under a mydriatic I found: R. + .25 S. + .50 cyl. 150 degrees; L. + .50 cyl. 120 degrees. He was ordered: R. + .50 cyl. 150 degrees ⊃ 1½ degree prism base up; L. — .25 S. + .25 cyl. 120 degrees ⊃ 1½ degree prism base down. Four years later reports that he has been almost entirely free of migraine and his left hyperphoria remains exactly 6 degrees, just what it was 4 years ago. It was peculiarly gratifying to watch the disappearance of the migraine in this case, as the patient is a neurologist, and adheres somewhat to the present-day neurologic belief that migraine is seldom benefited by ocular treatment.

Case V.—April, 1902. Miss L. K., schoolgirl of 16. Father has had fearful headaches all his life. Mother none. Patient had chorea as a child. Now vertigo and nausea and terrific right hemicrania of the migraine type. Her general physician reports the heart, general circulation and kidneys normal. Vision, 5/5, both eyes. There was esophoria of 8 degrees and left hyperphoria of 13 degrees, and yet the girl had full binocular vision, as proven with Hering's test box. There was no facial asymmetry and no diplopia in any part of the periphery. The arc rotations showed defective upward rotation of the right eye. Under a mydriatic she showed 1 diopter of plain hypermetropia in each eye. She was ordered: R. + 0.75 ⊃ 5 degree prism base up: L. + 0.75 ⊃ 5 degree prism base down, and has worn them with almost complete relief of her symptoms. To-day, almost 7 years later, her total left hyperphoria = 13 degrees, that is to say, the identical amount she showed in 1902.

CASE VI.—January, 1902. Miss E. B., accountant, aged 26. Only symptoms, car sickness and drowsiness after near work. General health good. Vision R. 5/5 and L. 5/12. Exophoria equals 7 degrees. Convergence point 5 inches. Left hyperphoria 6 degrees. There was marked facial asymmetry; no diplopia; defective upward rotation right eye; supra and infraduction were equal. Under a mydriatic she showed: R. + .50 cyl. 90 degrees; L. — .50 S. + 1 cyl. 90 degrees. She was ordered: R. — .50 cyl. 180 degrees ⌒ 1 degree prism base in ⌒ 2 degree prism base up; L. — .50 S. + 1 cyl. 90 degrees ⌒ 1 degree prism base in ⌒ 2 degree prism base down. With these she has been absolutely comfortable, and to-day, after seven years, her total left hyperphoria is the same as it was seven years ago.

CASE VII.—1902. W. R., aged 36; photophobia, occipital headache, supra and infraorbital neuralgia; painful eyes after near work for years. Amenable to no general treatment whatever. General health only fair. Was wearing: R. — 2 cyl. 180 degrees ⌒ 2 degree prism base in; L. — 2 cyl. 180 degrees ⌒ 2 degree prism base in. These had afforded him much relief for four years. Examination revealed exophoria of 10 degrees for infinity and 17 degrees for near. Convergence near point 2½ inches. Prism divergence = 13 degrees. There was right hyperphoria of 2½ degrees with no diplopia; right supraduction and infraduction equal. Under a mydriatic the refraction was: R. + .50 S. — 2.75 cyl. 180 degrees; L. + 1 S. — 2.75 cyl. 180 degrees, and the following was ordered: R. — 2.75 cyl. 180 degrees ⌒ 4 degree prism base in ⌒ 2½ degree prism base down; L. + .50 S. — 2.75 cyl. 180 degrees ⌒ 4 degree prism base in. These he has worn for seven years with a degree of comfort never experienced before. To-day the total right hyperphoria is exactly the same as it was seven years ago.

REMARKS.

Many more such cases could be produced from my records. I have simply submitted these in rebuttal of the statement that it is useless to order prisms for constant wear, because they must constantly be increased in strength. Here are seven hyperphorias, most of them of high degree, which have shown no increase whatever in their vertical deviation after anywhere from four to seven years' use of a vertical prism.

One other point, namely, the migraine in two of these individuals. These are noteworthy principally because of the present-day tendency of the neurologic fraternity to look askance at any and all claims on the part of the ophthalmic profession that migraine may be related etiologically to faulty refraction or muscular eye-strain.

GROUP III—CASES SHOWING INCREASE OF HYPERPHORIA.

Case I.—May 10, 1904. G. G. C., physician, 45: photophobia, indigestion, nervous irritability, etc. Refraction = R. — .50 S. — .50 cyl. 135 degrees = 5/5; L. — .25 cyl. 90 degrees = 5/5. Left hyperphoria 2 degrees. Exophoria 4 degrees for infinity and 8 degrees for occupation distance. Convergence near point was 3 inches. Arc rotations negative. No diplopia. He was ordered: R. — .25 S. — .50 cyl. 135 degrees; L. — .25 cyl. 90 degrees ⌒ 1 degree prism base down. For near + 1 sph. added. These were worn for four years in an invisible bifocal. Four years later he returned, showing the same refraction for infinity, and + 2.25 sphere added for near work. Left hyperphoria now 4 degrees. The following was prescribed: R. — .25 S. — .50 cyl. 135 degrees; L. — .25 cyl. 90 degrees ⌒ 2 degree prism base down. For near add + 2.25 sph.

Case II.— March, 1905. Mrs. F. H. B., aged 65, wearing R. + 2.25 S. + .25 cyl. 180 degrees ⌒ 2 degree prism base down; L. + 2.50 S. + .50 cyl. 180 degrees ⌒ 2 degree prism base up. For near, add + 3.00 sph., which had been given her by an empiric. Comes because of dull headache and vertigo. I find exophoria 3 degrees for infinity, ½ degree for reading distance, right hyperphoria 6 degrees. No diplopia. Arc rotations show defective downward rotation in right eye. I ordered: R. + 2.25 S. + .50 cyl. 180 degrees ⌒ 3 degree prism base down; L. + 2.75 S. + .50 cyl. 180 degrees ⌒ 3 degree prism base up. For near, add + 2.50 S. in invisible bifocals. One year later, quite comfortable.

Three months ago returned, at my request, and I find 8 degrees total right hyperphoria, as against 6 degrees four years ago. But as she is perfectly comfortable, I added nothing to her prisms.

CASE III.—Mrs. P. F. B., aged 55. Photophobia; aching, painful eyes after near work; vertigo, headaches. Was wearing a good nonprismatic correction. Esophoria of 3 degrees and left hyperphoria of 4 degrees. No diplopia. Arc rotations negative; right supraduction = 2 degrees; infraduction = 4 degrees. I ordered: R. — .50 S. — 3.50 cyl. 90 degrees $\overset{\frown}{\smile}$ 2 degree prism base up; L. + 1.25 cyl. 180 degrees $\overset{\frown}{\smile}$ 1½ degree prism base down. Add + 2.00 sph. for near work. Three years later her total left hyperphoria had increased to 6 degrees, and she was given a total of 5 degrees to wear. One year later the total left hyperphoria was 8 degrees of which she was given 6 degrees to wear in an invisible bifocal glass. She is fairly comfortable with them.

CASE IV.—March, 1899. Dr. L. F. A., aged 26. Refraction = R. — .25 S. — .75 cyl. 180 degrees; L. + .50 S. — .75 cyl. 180 degrees. With these there was exophoria 1 degree, and left hyperphoria 1½ degrees. Doubtful diplopia in extreme upper right field. Arc rotations normal. Supra and infraduction equal. I ordered: R. — .50 S. — .75 cyl. 180 degrees; L. + .25 S. — .75 cyl. 180 degrees $\overset{\frown}{\smile}$ 1 degree prism base down. Four years later it was found that the left hyperphoria had advanced from 1½ to 3 degrees. Ordered 2¼ degree prism base down, left eye. One year later, left hyperphoria had advanced from 3 to 4 degrees, and a total of 3 degree prism, base down, was ordered in left eye. With this prism he follows a busy professional career and uses his eyes with practically no discomfort.

REMARKS.

These cases are typical of the advancing type of hyperphoria, but in nowise argue against the value of the vertical prism. Indeed it would be absurd to advance any such argument, as the prisms were productive of relief in every case.

GROUP IV.—THE PARETIC HYPOPHORIAS.

Not enough insistence has been laid on this class of cases, which generally escape accurate diagnosis, and are put down as hyperphoria, when they are, in fact, hypophoria.

Case I.—Mrs. V. M. M., aged 22, comes on account of panoramic headache, vertigo, trolley-car sickness. Could not ride more than five or six blocks in cars. Profoundly neurasthenic. Thin, poorly nourished woman in precarious health. Vision. R. 6/6, L. 6/6. Wearing R. + .25 S. + .50 cyl. 90 degrees; L. + .25 S. + .75 cyl. 90 degrees. Maddox rod showed exophoria 2 degrees, right hyperphoria 8 degrees. Diplopia was plainly manifest in the upper left field, with the left image higher, pointing to the left superior rectus as paretic, and showing plainly that the diagnosis was paretic left hypophoria instead of right hyperphoria. Under hyoscin it was found that the axes of her cylinders had changed, so she was ordered the following: R. + .50 S. + .75 cyl. 100 degrees; L. + .75 S. + .90 cyl. 80 degrees ⌢ 4 degree prism base up, and these she has worn for two years, with complete disappearance of all her symptoms.

Case II.—B. H., aged 36, accountant; comes complaining of irritable eyes, intractable headache, occasional vertigo while at his work. General health fair. He was wearing R. — 1 S. — .50 cyl. 45 degrees ⌢ 1 degree prism base in; L. — 1.25 S. — .50 cyl. 135 degrees ⌢ 1 degree prism base in. The Maddox rod showed vertical imbalance of 3 degrees, and exophoria of 4 degrees for infinity and 6 degrees for the reading distance. His convergence near point was 4½ inches. Under cycloplegia his refraction was: R. — .75 S. — .50 cyl. 60 degrees = 5/5; L. — 1 S. — .50 cyl. 120 degrees = 5/5. It was decided to drop the lateral prism, as in the extreme upper right periphery he showed diplopia with the right image higher (= right hypophoria). He was therefore ordered: R. — 1 S. — .50 cyl. 60 degrees ⌢ 1½ degree prism base up; L. — 1.25 S. — .50 cyl. 120 degrees. This was three years ago. He reported recently that he had been more comfortable in the use of his eyes than at any time in the last 12 to 15 years. His total vertical imbalance remains at 3 degrees, just as it was two years previously.

Case III.—A. Z., aged 47, a traveling salesman, was referred by his general physician on account of persistent low-grade blepharoconjunctivitis and epiphora, for which he had been treated for two years by various oculists without relief. In that time he had been given three different corrections.

He was rather a portly man in most excellent health, but complained that he could not look out of the car windows without becoming uncomfortable, and yet could not read in the train without getting headache, so that he slept most of the time he was traveling. He was wearing, R + 50 cyl. 20 degrees; L. + .25 S. The Maddox rod showed at the first visit one degree of vertical imbalance and lateral balance. Aside from the blepharoconjunctivitis there was no other abnormality in either eye. This inflammatory condition was treated with U. S. P. glycerite of tannin. At the third visit, the Maddox rod finally uncovered three degrees of vertical imbalance, and at this same time diplopia was found in the extreme upper field, showing, as in the previous case, right hypophoria. His refraction was found to be R. — .25 S. — .25 cyl. 90 degrees; L. — .25 cyl. 13 degrees, with an addition of .75 S. for near work. He was ordered R. — .25 S. — .25 cyl. 90 degrees ⊃ 1½ degree prism base up; L. — .25 cyl. 13 degrees. For near add + 1.00 sphere.

He experienced considerable difficulty in becoming used to them, but for the last six months has had complete relief from his inflammatory condition without any treatment whatever.

REMARKS.

While hypophoria is not nearly so frequent as hyperphoria, it is our feeling that in every vertical imbalance of two degrees or more the extreme upper right and left periphery of the binocular fixation field should be thoroughly investigated before finally deciding between hyperphoria and hypophoria.

The foregoing case histories are all in favor of the use of the vertical prisms and the question may well be asked whether disappointing results ever follow their incorporation into the correction given for constant wear. The following case history will furnish a fitting answer:

J. M., aged 22, a frail, neurotic, tiny unmarried woman, was referred by her general adviser, who stated that he had exhausted his resources in trying to relieve her neurasthenia. She was wearing R. + .75 cyl. 75 degrees = 5/9; L. + .75 cyl. 105 degrees = 5/9. With these there was exophoria of 10 degrees for infinity, and 18 degrees for the reading distance. There was no hyperphoria in evidence. Her convergence near point was six inches: Under thorough cycloplegia we found:

R. + .50 S. + 1 cyl. 60 degrees = 5/7;
L. + .50 S. + 1 cyl. 145 degrees = 5/7.

She was ordered the cylinders only without any prisms, but 5-degree prisms bases out, were directed to be used five minutes morning and night after Gould's method of convergence exercise. In four months she was much better. Then a sudden access of all her old symptoms led me to incorporate permanent prisms in the position of rest in her glasses as follows: R. + 1 cyl. 60 degrees $\overset{\frown}{\smile}$ 2 degree prism base in; L. + 1 cyl. 145 degrees $\overset{\frown}{\smile}$ 2 degree prism base in. Prism exercises were continued with the conjoint administration of increasing doses of nux vomica. She was greatly improved for a year, but after a severe attack of la grippe, returned with a relapse into her old ocular condition. The total exophoria for infinity was now twelve degrees (an increase of but two degrees over that found eighteen months before), but she now revealed one and a half degrees of right hyperphoria.

Right supraduction was four degrees, infraduction two degrees. Suspecting the nasal cavities, she was referred to a rhinologist, who reported the upper respiratory tract as absolutely normal. It was, therefore, decided to add a three-fourth degree vertical prism tentatively to her previous correction, but after six weeks' trial of it, during which time all her symptoms increased, the vertical prism was withdrawn and one degree added to her lateral correction, which she has now worn for three years with almost entire comfort. Her general health today is infinitely better than at any time during the past ten years.

So that occasionally the vertical prism fails utterly in spite of the plainest clinical indications for its use. I have had but three such cases in the past 12 years in which I have felt obliged to remove a vertical prism that has been prescribed.

Let no one be led by this rather enthusiastic endorsement of the vertical prism into ill considered use of this practice in ophthalmic work. Even after all possible clinical evidence has been obtained and the decision made to try a vertical prism, it seems the part of wisdom to feel one's way and never order more than one-half of the infinity deviation in low grade errors (less than two degrees) and one-third of the infinity deviation in high grade hyperphorias (more than three degrees). This does not accord with the academic phase of the question, which would assume that in the presence of four degrees of hyperphoria, four degrees of prism should be used to end the patient's discomfort once and for all, but just as the internist recognizes lack of cardiac compensation, and aims to help the heart make up its lack, so should we recognize in most hyperphorias a lack of ocular compensation and aim only to make up that lack by interposing just enough vertical prism to help the eyes to do their work comfortably.

As to operation, I shall only say that a recent tabulation shows that I have tenotomized but one in forty-seven of all the hyperphorias I have been privileged to treat, and these only after prismatic treatment proved unavailing.

Finally, it is a pleasure to find that I can repeat almost verbatim the following conclusions with which I closed my communication before the American Medical Association at Atlantic City in 1900 on this same subject:

1. Hyperphoria is likely to be latent before the thirtieth year, and manifest after that time.
2. It occurs most frequently to the extent of about one degree.
3. The usual symptoms are supraorbital transient vertigo, drowsiness, irritable eyes and abnormal physical fatigue after prolonged near work.
4. A full quota of sleep, daily open air exercise and a well-regulated life are all highly important factors in the management of these cases.
5. Convergence repression, if convergence is excessive, and convergence training, if convergence be defective, often relieve hyperphoric symptoms entirely.
6. In properly selected cases, the vertical prism has a field of pronounced usefulness.
7. If used conservatively, prism corrections ought to be of service in 75 per cent of all cases.
8. Tenotomy should be absolutely the last resort. If cases are properly studied and treated, not more than two to four per cent of all cases should come to operation.
9. No problem in ophthalmology is worthy of deeper study.

1212 Spruce Street.

AN IMPROVED ASTIGMATIC AXIS FINDER.*

EDWARD B. COBURN, M. D.,

NEW YORK.

When making a careful examination of a patient with astigmatism, resort is made to the direct method of ophthalmoscopy, to the ophthalmometer, to retinoscopy, to the astigmatic axis dial, and after the use, perhaps, of other tests, the subjective test with trial lenses is made and the final decision as regards the position of the axes of the correcting cylinders is left to the patient. It is, perhaps, fortunate that the axes of astigmatism usually lie in the vertical or horizontal meridians. When the axes are oblique, it is the custom of many oculists to look for a symmetry in the position of the axes, and if this is not obtained readily, to either approximate a symmetrical disposition of the axes, or to force such a relation on the refractory eyes. Others contend that the axes should form with each other certain mathematical relations or that the axes must lie in certain zones. As may be shown by an examination of the prescriptions usually ordered from opticians, a closer determination of the axis is seldom made nearer than 5 degrees. This may be, and probably is, due to the fact that the markings on the trial frames or stationary holders are only in five degree intervals, owing to their small size. Only when the testing is done by the method of fogging or blurring does there seem any disposition to indulge in numbers less than 5 degrees, and this appears to arise as the result of a mathematical computation—the mean of several readings—and then an accuracy up to one-half degree is claimed. This delicacy is, of course, impossible because a trial with suitable apparatus will show that the average human eye is not able to distinguish the revolution of a cylindrical lens of several degrees even though the cylinder have a strength of 3 or 4 dioptres. This would seem to be an argument against greater accuracy in prescribing, but with stronger lenses small displacements of the cylindrical axes are quite apparent and with all eyes there is probably a correct axis which we should endeavor to discover. Displacements of the trial frames and faulty position of the head of the patient may give rise to further errors.

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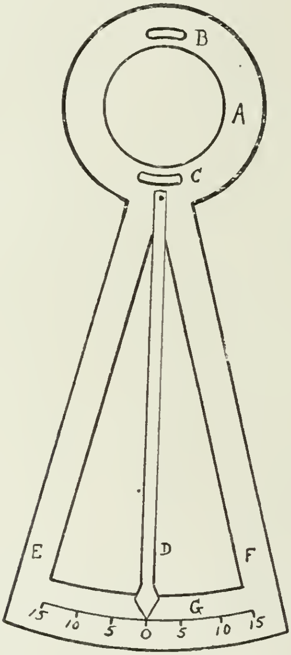
*Presented to the Section on Ophthalmology, New York Academy of Medicine, October 17, and November 21, 1910.

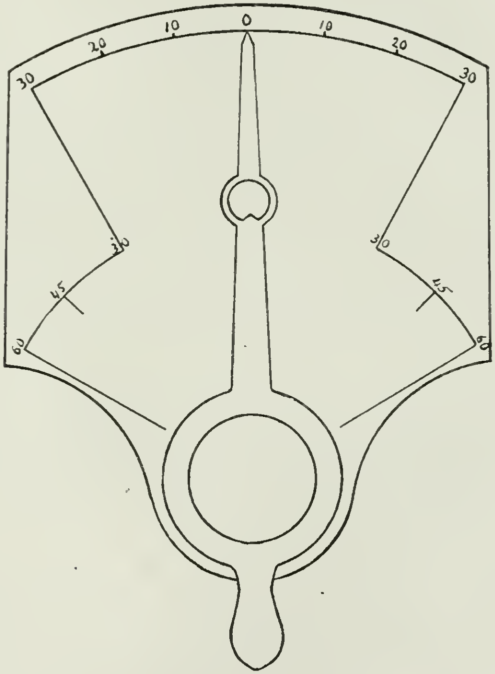
To obviate these difficulties and to promote accuracy I have

Fig. 1



devised two axis-finders, one portable and one for stationary use. The smaller one is depicted in Fig. 1. The instrument consists of a fenestrated framework of brass (A, E, F) to hold the trial lens and a scale attached by two arms with a pendulum pointer (D) suspended just below the lens-holder. Above and below the opening in the lens-holder are two short finger pieces (B, C) projecting at right angles to the body of the instrument. The scale has markings of one degee up to fifteen degrees on both sides of the central point, and as the pendulum is five inches long the markings are quite large and permit of easy and accurate reading. In conducting the examination the approximate axis may be roughly determined within fifteen degrees either by the various methods above mentioned or by holding the lens in the fingers before the patient's eye. The lens is now placed in the holder (which is on the reverse side and is not shown in the picture) at the axis already approximately determined (and for which there are suitable markings on the lens-holder indicating 15-degree arcs) and holding the instrument so that the patient can see through the lens, the instrument is rocked laterally on the supporting finger until the position of best vision is indicated by the patient. By inclining the instrument slightly on the flat side the pendulum remains in place and the number of degrees

Fig. 2



of rotation may be read and then added or subtracted from the angle at which the lens was inserted into the lens-holder. If the method of fogging is employed the instrument may be turned to one side until fogging appears and the reading taken. Then turn the instrument to the other side until blurring appears and take the reading. The correct amount to be added or subtracted will be obviously the point midway between the two readings.

The stationary apparatus (Fig. 2) consists of a brass plate with an opening and a holder for the lens on a revolving cell. To the lower part of the cell is attached a handle and to the upper part is attached a pointer eight inches long. The pointer sweeps over a scale 30 degrees on either side of the zero mark and fenestrations in the pointer enable positions up to 60 degrees to be read. With this instrument the cylinder may be placed either horizontally or vertically as seems indicated and after determination of the axis by rotation of the lens in the holder in front of the patient's eye the proper computation gives the correct axis as before. The markings are of one degree on this instrument, and because of the greater arc, it is more accurate than the portable instrument. If desired two cells may be provided for testing both eyes simultaneously.

A Maddox rod placed in the lens-holder will convert the instrument into a clinometer. This instrument is also useful in making certain psycho-physiological experiments in regard to the appreciation of rotation movement of cylindrical lenses and other problems.

9 East 40th Street.

THE SCIENTIFIC VERSUS METHOD BY RULE, FOR CONVERTING CROSS CYLINDERS INTO COMPOUND LENSES.

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During the winter of 1901-2 I presented the scientific method of cross cylinder conversion to the Eye, Ear, Nose and Throat School of Chicago. I recently learned that even now the old rule method is still taught in a certain school in the same city.

The scientific method rests on the following two fundamental facts:

First: Two cylinders of opposite axis, of the same strength and denomination, are equivalent to a sphere of like strength and denomination.

EXAMPLE.

+ 1. cyl. axis 90 deg. ⊃ + 1. cyl. axis 180 deg. = + 1. sphere.

Second: Two cylinders of like strength and axis but of opposite denomination, will neutralize each other.

EXAMPLE.

+ 1. cyl. axis 90 deg. ⊃ 1. cyl. axis 90 deg. = plano (zero).

Therefore, to convert a cross cylinder into a compound lens make a sphere of the one cylinder by adding to it a cylinder of the same strength and denomination, but of opposite axis, and to the other or remaining cylinder add the same cylinder (but of opposite denomination) used or required to convert the first cylinder into a sphere.

EXAMPLE.

(Cross Cyl.)—.25 cyl. axis 90 deg. ⊃ + 1. cyl. axis 180 deg.
(Correction)—.25 cyl. axis 180 deg. ⊃ + .25 cyl. axis 180 deg.
Adding = Com. Lens—.25 sphere ⊃ + 1.25 cyl. axis 180 deg.

Compound lenses may be simplified in a similar manner. The sphere should be reduced to its cylinder form and any neutralizing cylinders may then readily be recognized and eliminated.

EXAMPLE.

+ 1. sphere $\overset{\frown}{\smile}$ — 1. cyl. axis 180 degrees. The + 1. sphere may be reduced to + 1. cyl. axis 90 degrees and + 1. cyl. axis 180 degrees. The latter cylinder neutralizes — 1. cyl. axis 180 degrees, thereby leaving only + 1. cyl. axis 90 degrees.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(UNITED STATES OF AMERICA.)

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Small Round Cell Sarcoma of the Cellular Tissues.

WEIDLER, WALTER BAER, New York (*Ophthalmic Record*, January, 1911), reports the case of a colored man, aged 69, who was struck on the right eyelid and brow with a piece of wood. There was a slight swelling, which disappeared in a few days. A year later the swelling returned and became painful. A small piece of the tumor was removed, and the patient was advised not to have an operation, but as the pain and swelling continued to increase, three months later he was operated on by the writer. A curvilinear incision was made 6 mm. below the supraorbital ridge, and through this the eye and a portion of the growth was removed. The growth extended to the optic sheath, and it was impossible to remove it completely.

O. W.

Sporotrichosis of the Eyeball and Eyelids.

Gifford, H., Omaha, Neb. (*Ophthalmic Record,* November, 1910), reports three cases. The first was that of a young woman who regarded the trouble as a result of having had an upper tooth pulled. The affected eye, the left, was irritated and watery, with a slight congestion of the tarsal conjunctiva and retrotarsal fold, and a crescentic thickening of the ocular conjunctiva. This thickening was smooth and red at its broadest portion, but was nodulated at the extremities. One of these nodules was yellowish and contained a semi-fluid substance the cultures of which showed a characteristic growth of sporotrichosis. She was ordered iodide of potash, but was neglectful in taking it. When she passed from observation the growth had diminished.

The second case was that of a boy ten years old who had a swelling on the left lower lid. There were two elevated areas of rough granulation tissue. These were scraped away, burned with the Paquelin cautery and covered with Thiersch flaps. X-ray treatments were given. The flaps did not adhere, but the boy was able to be sent home. Later he was heard from as having had no further trouble.

The third case was that of a woman, aged 22, who had a growth below the left eye. In the inner half of the left lower lid there was a mass of granulation tissue from which a purplish-red mass covered with very thin skin extended to the bridge of the nose at the inner commissure. Under cocaine the granulations were scraped out, an iodoform dressing applied, and iodide of potash administered internally, after which there was complete recovery. O. W.

On the Presence of Noninflammatory Exudates in the Aqueous Humor.

Chance, Burton, Philadelphia (*Ophthalmology*, January, 1911), reports that he has frequently found fine granules floating in the aqueous in otherwise healthy eyes and immediately after using some of the quick cycloplegics, that they disappear in a day or two and that he has never seen any after-affect of such exudates. There were no subjective symptoms and the appearance was commonly associated with some disorder of digestion and gastro-intestinal intoxication. The urine also showed deranged metabolic processes. Are these granules coagulated particles of albumin from the iris and ciliary vessels, or migratory capillary cells, or degenerated leucocytes, or did the cycloplegic cause a forcible rolling up of the iris and thus mechanically press upon the vessels and squeeze out their contents? We know that atropin and allied drugs tend to stiffen the blood-vessel walls, that relief of ciliary spasm acts favorably upon congestion of the chorioid and that because the relief of the venous stasis the aqueous can become rapidly purified. This may be the explanation of both the appearance and rapid absorption of these exudates. Attention is called to a possibly related condition which has been noticed when the kidney has excreted the phosphates or sulphates in excess after the administration of atropin. Also, derangement of the metabolic chemistry of the intestinal tract favors the augmentation of the intravascular tension through an increase in the solids of the blood which may have tended to an increase in the solids of the aqueous humor, a condition which may be similar to that seen in the kidney under similar conditions. A. F. A.

Traumatic Subconjunctival Dislocation of Cataractous Lens in Its Capsule.

Maynard, F. P., Calcutta (*Ophthalmology*, January, 1911). A Hindu, age 48, was struck in the eye by a piece of steel. An hour later he was seen with the eye practically uninjured except that the lens was dislocated beneath the conjunctiva and under the upper lid. It was removed without loss of vitreous and was found to be an overripe cataract in its capsule. The eye healed uneventfully and with good vision. A. F. A.

A New Operation for the Extraction of a Cataract in Its Capsule.

Hulen, Vard H., Houston, Texas (*Ophthalmic Record*, December, 1910), says this operation is on the new principle of fixing the lens by a small vacuum cup and gently lifting the cataract in its capsule out of the eye. The necessary apparatus is described and illustrated, and is designated a vacuum extractor.

After the usual preliminary preparations the extractor is introduced through the section and gently let down on the lens, precaution being taken to see that the cup is free of the pupillary margin. The patient should look straight ahead. When the cup is resting over the center of the anterior capsule the cock of the gauge is turned, the vacuum thus connected will cause the cup to grasp the cataract. The extractor is then elevated and rotated to sever the suspensory ligament, and with the upper edge of cup slightly raised the cataract in its capsule is lifted out.

Three cases are mentioned in which this operation was successfully performed. O. W.

A Case of Ulcerous Scleritis.

Roenne, Henning, Copenhagen, Denmark (*Ophthalmology*, January, 1911), reports an unusual case of suppurating nodular scleritis. A man, aged 35, with an otherwise good clinical history, presented a scleral injection of one eye with a yellow spot formed in the injected part. Later the condition became more marked with six yellowish nodes, two of which were distinctly but superficially ulcerated. Later one other node ulcerated and the ulcers became deeper. In a month they had healed leaving slate colored scars. Later there was a recurrence. The microscopic examination of a piece of tissue removed from one of the nodes showed it to consist largely of a mixed heap of lymphocytes and plasma cells without grouping and with no evidence of tubercular infection.

A. F. A.

A Report of Sixty Cases of Trachoma Treated After the Coover Method.

Martin, H. H., Savannah, Georgia (*Ophthalmology*, January, 1911), treated sixty cases by the Coover method—i. e., by scrubbing away the granulations with No. 00 or 0 sandpaper. Fifteen were given no other after treatment and forty-five were treated for from four to eight weeks with daily use of a saturated solution of copper sulphate. In all the cases the eyes were flushed after operation with salt solution to remove the particles of sand and debris and scrubbed with bichloride solution. Ten months after operation 80 per cent of the first group showed recurrence and thirty per cent of the last group.

A. F. A.

Parinaud's Conjunctivitis, With Report of a Case.

MATHEWSON, GEO. H., Montreal (*Ophthalmic Record,* December, 1910), reports the case of a woman 33 years old. The conjunctiva of the upper lid was much swollen, and presented a number of reddish nodules. On the outer side of the median vertical line was a small ulcer. The left preauricular gland was swollen to almost the size of a hazel nut, and increased in size until it was as large as a pigeon's egg and showed fluctuation. It was then incised, and about a drachm and a half of thick, greenish pus escaped, cultures from which showed only saprophytic bacteria. The wound healed promptly and the eye became normal. O. W.

Parinaud's Conjunctivitis, With Report of a Case.

KEIPER, GEORGE F., Lafayette, Ind. (*Ophthalmic Record,* January, 1911), describes a case of this disease met with in a farm laborer aged 18. When seen the right side of the face and especially the glands of the neck were swollen and tender. The eye was shut, the lids heavy and thick. Palpebral and ocular conjunctivæ were much swollen. There was a slight discharge from between the lids. The everted upper lid appeared to be swollen into one large granulation with smaller ones under the overhanging edges.

Treatment consisted of a daily application of a 2 per cent solution of nitrate of silver to the everted conjunctiva, and the use of hot compresses. Every three hours a 10 per cent solution of protargol was dropped into the eye. Every hour the eye was washed out with the following collyrium:

Zinc Phenolsulphat	gr. j
Acid Boric	gr. x
Aquæ Dest	j

Calomel, quinine and iron were administered. When dismissed from the hospital he had a smooth, normal conjunctiva, and normal vision. O. W.

Studies on the Pupil.

HUMMELSHEIM, Bonn (*Archives of Ophthalmology,* November, 1910), conducted his experiments by means of an instrument especially devised but not yet published by Prof. C. Hess, which showed that the pupil contracts and dilates concentrically. This was the uniform and invariable finding in

130 eyes. Among the subjects examined there were several with astigmatic eyes, one with marked unilateral astigmatism, in all of whom the pupillary contraction did not vary from the normal concentric type. H. G. G.

The Histologic Findings in a Case of Tuberculous Cyclitis, and a Theory as to the Origin of Tuberculous Scleritis and Keratitis.

Verhoeff, F. H. (*Archives of Ophthalmology*, September, 1910), has confirmed his former observations in a still larger series of cases which show that the condition designated as anterior nodular scleritis is always due to tuberculosis. This evidence, while partly histologic, consists chiefly in the results of subcutaneous tuberculin injections in a consecutive series of cases. While a local reaction in the eyes did not always occur in the diagnostic tests, it could practically always be obtained later if treatment with old tuberculin was carried out with this end in view. The writer describes in elaborate detail the clinical course of a case with the histologic findings of recurrent tuberculous sclero-keratitis. In this case the local and general tuberculin reactions repeatedly obtained showed conclusively that it was one of chronic ocular tuberculosis. He concludes that in tuberculous scleritis the infection reaches the sclera through the filtration angle. The infecting bacilli are derived chiefly from the superficial vessels of the ciliary processes, and are carried in the aqueous humor to the filtration angle. Whether there are always small initial foci on the surface of the ciliary processes, or whether the bacilli, contained probably in phagocytic cells, are exuded through the intact pars ciliaris retinæ, is uncertain. In tuberculous keratitis the infection is also through the aqueous, the cornea becoming infected either by metastasis or extension from foci about the filtration angle, or in a similar manner from the foci of a preceding scleritis. In pure tuberculous keratitis, which rarely, if ever, occurs, the infection takes place in the former way only. Two forms of tuberculous cyclitis are to be distinguished, namely, the interstitial and the superficial. Interstitial cyclitis is usually secondary to scleritis, and due to the direct extension of the latter. Superficial cyclitis occurs from direct blood metastasis. Clinically, it manifests itself as one of the forms of serous cyclitis. Superficial tuberculous

iritis, involving the posterior surface of the iris, may occur, and is analogous to superficial cyclitis, with which it is probably often associated.
H. G. G.

Lymphocytosis as a Diagnostic and Prognostic Symptom in Cases of Iridocyclitis After Perforating Injury.

GRADLE, HENRY L. (*Archives of Ophthalmology*, November, 1910), while studying histological sections of eyes which showed the characteristic changes of sympathetic ophthalmia, was impressed with the fact that practically all the infiltration was formed by one type of cells, that known as the mononuclear leucocyte. The query occurred to him whether such an extensive mononuclear infiltration would not be recorded by the circulating blood. With this object in view he examined the blood in cases of perforating injury of the eye, with and without iridocyclitis and in nontraumatic iridocyclitis, which could not lead to sympathetic ophthalmia. From this test the results were so unanimous that there was no question left in his mind regarding the truth of the problem. By staining and counting he obtained the percentage relationship of the various white cells, but in compiling results, found that it was the relationship of the total number of polynuclears to the total number of mononuclears that was needed. In the relationship of these two forms he divided his cases into two general classes, and concludes that it can be definitely stated that in cases of perforating injury of the eye an increase of the mononuclear elements of the blood at the cost of the polynuclear elements is significant of a malignant course.

H. G. G.

An Unlearnable Vision Test Card for Use in the Naval Service.

GROW, E. J., Washington, D. C. (*Ophthalmology*, January, 1911). For use in the United States Navy and to secure uniform results in testing, a chart has been devised with these measurements carefully revised and corrected and containing no letters larger than necessary to determine 20/20 vision. Three rows of letters small enough to determine 20/15 vision, as required for gun-sighters, are added below. An illumination of between 30 and 50 meter candles gives the best result. The chart is covered by a screen through which are two slits large enough to expose a single row of letters, one horizontal and the other vertical. By raising or lowering this screen or moving it to either side, any row of letters may be exposed, horizontal or vertical, and only one row of each at a time. Memorizing is thus prevented. A. F. A.

The Etiology, Pathology and Treatment of Concomitant, Convergent Squint.

EMERSON, LINN, Orange, N. J. (*Ophthalmology*, January, 1911), says that the loss or absence of the fusion center is not the only cause which will produce deterioration or loss of the fusion faculty. Congenital, orbital or muscular abnormalities, or imperfect vision may produce deterioration or loss of this faculty, or may prevent its development, and this defect is the cause of squint. This fusion faculty is a development faculty and capable of improvement by training, or of rapid deterioration when not trained, or when the treatment is intermitted. For this reason correction and treatment should be begun at an early age, even at eighteen months, with good prospects of cure. The accommodation of the fixing eye should be kept relaxed by atropin, a full correcting glass given and the eye excluded for a few hours at frequent intervals. As soon as the child is old enough the amblyoscope and stereoscope should be used. Combined treatment and operation are of great value and should be undertaken early. In the advancement operation, as performed by the writer, the tendon is slit longitudinally for 4 or 5 mm. and each half carried well over to the insertion of the superior and inferior rectus respectively and anchored to it by a loop. A. F. A.

Cyclophoria.

BRADBURNE, A. A., Southport, England (*Ophthalmology*, January, 1911). A form of strain of the ocular muscles which is commonly overlooked and often uncorrected is known as cyclophoria or torsion of the eyeball around its horizontal and antero-posterior axis, more particularly that form resulting from the use of cylindrical lenses for near work. It may be seen readily that when the eyes are depressed and converged in doing near work, all the muscles assume new positions and tensions and that the resultant tension upon the eyes may be and commonly is modified by the action of the obliques. When the eyes are thus directed downward and inward a certain amount of outward tilting of the vertical meridians of the eyes is essential for clear vision, but if any unusual or excessive action is required to accomplish this, a condition of strain results, which is in no way present when the eyes are in use for distance vision. After a more or less protracted period of such strain the muscles may become set in their condition of abnormal tension and position and the torsion be transferred to distance vision as well. Another complication sometimes results when cylindrical lenses are used for near vision. If the eyeballs take a new position around their antero-posterior and horizontal axes as the result of torsion it is evident that a cylindrical lens whose axis has been determined for distance and for vision in a level plane will not properly correct the astigmatism in the new position of the eyes. The stronger the cylinder the more marked will be the error, although it will always be comparatively small. But the results of small errors of this kind are often marked and their correction frequently gives us our most satisfactory if not brilliant results. The method of determining and correcting this error is simple. The determined cylindrical correction is placed in the trial frame before each eye and a double prism with the base horizontal is placed before one eye. The eyes are directed upon a sheet of paper upon which has been drawn a horizontal line. The double prism over one eye gives an image of two horizontal lines. The other eye sees the single line drawn upon the paper and located between the two lines as seen by the other eye. If these three lines seem to be parallel to each other there is no cyclophoria. If the middle line is oblique to the other two lines the cylinders are to be rotated until the three lines are seen to be parallel to each other. This test also determines any horizontal displacement that may have occurred during accommodation, because if the eyes are correctly balanced horizontally the ends of the three lines will be even, but if the middle line extends to the right or left of the other two, such balance is imperfect and may be still further corrected by prisms placed base in or out, as may be necessary. These tests and corrections of course apply only to the use of the eyes for near and when corrected by cylinders. A. F. A.

A Series of Studies of Nervous Affections in Relation to the Adjustments of the Eyes.

STEVENS, GEORGE T., New York (*New York Medical Journal*, November 19, 1910), reports the case of a woman 33 years old, an epileptic for five years, in whom he found no important error of refraction or heterophoria. During repeated examinations he noticed that her head was habitually thrown back with her chin elevated. This suggested a restricted upward rotation of the eyes and an excessive rotation downward. The inferior recti were carefully relaxed by operation, with the result that she held her head in a normal position, and there was a great improvement as regards her epileptic attacks, which were completely relieved by further relaxation of the inferior recti. This case led to the invention of the tropometer and led to a study of the declinations of the eye. Although the result in this case was brilliant, the author has learned by experience that this procedure is not a safe one and that it is usually better to leave the inferior recti intact. By the operation a declination, unrecognized at the time, was corrected, and he believes that in a great proportion of the cases of idiopathic epilepsy the cause is a tilting of the meridians of the eye that he calls declinations.

In another paper (*New York Medical Journal,* January 7, 1911) he reports a case of imbecility in a girl 15 years old in which he made the diagnosis of high-grade declination of each eye and obtained a considerable degree of improvement in her condition by operations to correct it.

In another paper (ibid., January 28, 1911) he reports a case of torticollis and one of chronic spasm of the facial muscles, both in adults. In the first case the torticollis had existed seven years, but even as a girl the patient had been accustomed to carry her head on one side. No previous treatment had given even temporary relief, but operation for a very high degree of declination was followed by considerable relief. In the second case a man had suffered from extreme spasm of the facial muscles and a moderate torticollis for three years. He was completely relieved by operations for declination.

M. L. F.

Some Phases of Asthenopia.

Hunter, Dwight W., New York (*New York Medical Journal* January 21, 1911), divides cases of asthenopia into five classes: 1. Cases dependent on the general health, including heredity and defective development of the motor centers, but more particularly referring to cases of breakdown from overwork or worry; neurasthenic cases with the attendant cerebral and retinal exhaustion; protracted convalescence after acute diseases when the patients have read much while confined to bed. 2. Reflex cases, due to irritation in the nose, the uterus, the ovaries, or other organs. 3. Cases due to errors of refraction and accommodation. 4. Muscle cases, and 5, Mixed refraction and muscle cases. With the first two classes of cases this paper has no concern. Any error of refraction giving rise to symptoms should be corrected, but it does not follow that every patient with a refractive error needs glasses. The personal equation is a factor that must not be neglected. One individual with a very slight error will suffer torments until it is corrected, another with a much greater error will have no symptoms at all. In general, errors of refraction call for attention if only as subsidiary treatment. Hunter then discusses the difficulty in the diagnosis of muscle troubles and the therapeutic use of prisms. Finally, regarding operative intervention he says:

"There is no rule, there never can be, for determining that a certain degree of muscular insufficiency or overactivity requires a definite amount of cutting or advancement of a muscle. Indisputable proof of this assertion is found in the fact that men who use the most accurate instruments and make the closest measurements, men whose operative technique and skill is beyond question, often operate six, eight, ten and sometimes twenty times on one patient, which shows most conclusively that degrees in prisms and millimeters in muscles are not interchangeable values. I have seen many of these over-operated patients and have frequently listened to their expressions of profoundest regret that they ever submitted to the treatment. Their last state is often worse than their first. Not that I would decry operative treatment, for I have seen many brilliant successes as well as lamentable failures, but I do say that operations on the ocular muscles should be most carefully and conscientiously considered, and held in reserve as a last resort. Then, having determined the kind and approximately the amount of the error, we can go ahead, using our best judgment acquired by long experience. Results are necessarily uncertain. One more caution. Never, if you value your future peace of mind, put the points of your scissors beneath the conjunctiva of a neurotic patient." M. L. F.

Glaucoma from Adhesion of the Lens Capsule to the Cornea.

Knapp, Arnold (*Archives of Ophthalmology,* September, 1910), reports six cases, three of the traumatic variety and three following cataract extraction. Of the first class are the following: Traumatic irideremia; broad adhesion of capsule to transverse corneal wound; glaucoma. Traumatic irideremia; broad adhesion of capsule to cornea; glaucoma; enucleation. Broad adhesion of capsule to cornea; glaucoma. Of the second class the following three: Combined extraction; anterior capsular adhesion; glaucoma; enucleation. Combined extraction; anterior capsular adhesion; glaucoma; cyclodialysis. Combined extraction; glaucoma from capsular adhesion, cured by operation. He goes on to say that the cause for the glaucoma seems to be the obliteration of the angle of the anterior chamber by the ciliary processes or iris displaced forward by traction of the capsule adherent to the corneal scar as Treacher Collins has shown. This at least is the condition found on microscopic examination. The mere mechanical obstruction of the angle of the anterior chamber cannot be the only, or primary cause, as the cases show when only a small part of the capsule is adherent. The traction is greater the more central the corneal scar and the glaucoma is proportionately more severe. The total absence of the iris in his first two cases had no effect in counteracting the glaucomatous process, which shows the uselessness of an iridectomy as a remedial agent. When the scar is central and occupies the greater part of the corneal diameter we are powerless to prevent the progress of the glaucoma. Operations to divide the capsular adhesions seem even to make matters worse, as the regeneration is active, and the resulting capsular adhesion is denser than before. In the cases following cataract extraction, preventive treatment is most important. This condition occurs when the extraction has been performed with iridectomy and is facilitated by certain methods of opening the capsule. The avoidance of capsular complications is the greatest advantage of the simple operation. The importance of recognizing the dangers of capsular adhesions is accepted by all operators and it is a common practice to stroke back any capsular tags in the region of the iris coloboma. This cannot be done with certainty as the capsule is invisible. Delayed union with unrestored anterior chamber naturally predisposes to this accident. The treatment after the condition has occurred and the eye is hard, is to divide the adhesion. If the adhesion is broad, this is difficult and unsatisfactory; when the adherent band is narrow it can be readily divided in a manner to prevent its reuniting and the glaucoma is cured. H. G. G.

Optic Nerve Changes Associated with Cranial Malformations.

Gordon, Alfred, Philadelphia (*New York Medical Journal*, January 7, 1911), reports a case of oxycephalus met with in a boy eight and one-half years old. The examination of the eye showed exophthalmos and nystagmus; the vision of each was 6/30, and could not be improved by glasses; chorioretinitis and optic atrophy were present in both. The retinoscope showed the refraction of the right eye to be + .50 ○ + 1.25 ax. 90 degrees, of the left to be + 2.75 ○ + .50 ax. 75 degrees. The fields of vision, particularly that of the right eye, were contracted. The pupillary reaction was fairly normal, and the motor apparatus was in a good condition.

M. L. F.

Long-Continued Use of Strychnine in Toxic Amblyopia.

Blake, Eugene, New Haven, Conn. (*Ophthalmic Record*, November, 1910), describes a case that demonstrates the good results obtainable from the continued use of strychnine in alcohol-tobacco amblyopia. The patient was 38 years old. Vision was reduced to counting fingers at eight feet with the right eye, and at ten feet with the left. He had used alcohol freely for four years, and had been a confirmed smoker since boyhood. Advice to stop the use of alcohol and tobacco was complied with. Strychnine sulphate, gr. 1-30 t. i. d. was ordered. Vision rose to 20/200 during the first week and remained so for six weeks. Injections of strychnine, gr. 1-30 t. i. d. into the temples were made twice a week. Home treatment consisted of six tablets daily, by mouth, and for a short time, potassium iodide, gr. 10 t. i. d. Vision improved until it became 20/15 in each eye. O. W.

An Unusual Factor in Amblyopia.

Ruby, Fred McKemy, Union City, Indiana (*Ophthalmology*, January, 1904), reports a unique case. A seven year boy had vision of only 20/100 in each eye. The retinoscope showed a hypermetropia of one dioptre and the ophthalmoscope a chronic, passive congestion of the disk. No cause for the condition could be found except that he had been in the habit of standing on his head and hanging by the feet at frequent intervals and for considerable periods of time, in imitation of acrobatic performers. An upright position was enjoined and in due time the vision became 20/20 with one dioptre of hypermetropia. A. F. A.

A Case of Spasm of the Retinal Arteries.

BRUNS, HENRY DICKSON, New Orleans, La. (*Ophthalmology*, January, 1911), reports the case of a pale, delicate girl of thirteen years, who complained that her vision had been failing for two weeks and that three weeks before she had had a convulsion. The ophthalmoscope showed the arteries to be extremely small, the veins enlarged and dark, the disks pale, and a bluish-white (œdematous) halo extending over the retina for at least a disk diameter around each nerve. Pressure on the eyeball produced strong pulsations and finally almost total exsanguination of the retina. She came of a neurotic family; her sister had suffered from attacks of hysteria major and the patient herself had had convulsions. Nothing of interest could be elicited from careful physical examination except a trace of albumin in the urine, and without any efficient treatment the condition gradually improved for about two years, when she began to menstruate, the albumin disappeared and the vision became 20/15 in each eye for the first time. No other diagnosis seems to meet all the conditions of the case except that of arterial spasm. Considering that the patient was not conspicuously anæmic, with no stigmata of hysteria, but of a neurotic family, with traces of albumin for more than a year, and with plain signs of an unstable nervous constitution, with delayed menstruation, it is not unlikely that all of these conditions were dependent upon vaso-motor disturbances in the corresponding organs, due to a neurotic inheritance. A careful survey of the recent literature on the subject accompanies the paper. A. F. A.

A Case of Spontaneous Thrombosis of the Central Vein of the Retina Following Parturition.

BRAV, AARON, Philadelphia, Pa. (*Ophthalmology*, January, 1911), reports what, so far as he can discover, is the first reported case of thrombosis of the central vein of the retina following parturition. Practically always, thrombosis of the central vein is caused by a general sclerosis of the blood vessels, rarely earlier than 50 years of age and often in those required to do hard labor. The present case is quite the exception. Mrs. C. S., aged 19, had suffered from a chronic endocarditis for a number of years and had been advised against marriage, nevertheless she was married and delivered of a child on June 15th, 1910, after a short and easy labor. On the tenth day her feet began to swell, the œdema extending upward upon the succeeding days, and at the same time she complained of sudden blindness of the left eye. She was evidently suffering from rupture of compensation due to mitral stenosis and insufficiency of long standing. Ocular examination showed the pupil of the left eye to be large, with but slight light reaction, and the eye failed to converge beyond the median line. The conjunctiva was blanched and the vision was reduced to fingers at ten inches. The media were clear, the disk irregular, the edges not defined, somewhat hemorrhagic and swollen, the arteries narrower and paler than usual, the veins dilated and kinked as they emerged from the disk and were interrupted in their course by large hemorrhages. Throughout the retina, including the macula, which was of yellowish hue, were numerous hemorrhages of different sizes. The veins were filled with dark blood, interrupted in their course by hemorrhagic exudations. The patient died July 5th. This condition did not follow immediately any strain, occurring as it did on the road to recovery. Nevertheless, we must consider the pregnancy and labor as a contributory factor in the causation of rupture of compensation and the cause, not only of the loss of vision, but also of the patient's life. A. F. A.

A Rare Form of Teratoma Orbitae (Foetus in the Orbit, Orbitopagus Parasiticus.)

Mizuo, G., Osaka, Japan (*Archives of Ophthalmology*, November, 1910), describes in detail this rare form, the fifth or sixth yet reported, and goes on to say that the development in the case was so great that the teratoma may be designated as a fœtus, or at least as a teratoid fœtus. He believes that his case ranks first among all those reported in preservation of the outward form, the presence of true organs together, and the almost normal topographical positions of those organs. In the asymmetric double formations in which the parasite is attached to the head of the autosite, he classes his case in the first group, i. e., epignatus and related forms. H. G. G.

Vaccine and Serum Therapy in Ocular Tuberculosis.

DERBY, GEORGE S., Boston, Mass. (*Ophthalmology*, January, 1911). After the announcement by Koch in 1890 of the discovery of a cure for tuberculosis by tuberculin injections many practitioners made use of this method on the strength of the discoverer's reputation and, while good results were often secured, many unfortunate results began to be reported, particularly in pulmonary cases, with the result that the remedy was but sparingly used for a decade. This unfortunate outcome of the use of the remedy resulted from the fact that too large doses had been used and in advanced cases, although Koch had warned against this danger. Koch's original idea that tuberculin caused necrosis of tubercular tissue and acted only on living tissue and that large doses were therefore desirable is no longer tenable and we must regard the process as one of immunization against a bacterial toxin. Small doses and the avoidance of reactions as far as possible has come to be the practice. In 1898 Zimmerman reported a case in which an eye was apparently saved by the use of tuberculin after the other eye had been lost by tuberculosis, and this is the first record of the use of T. R. in ophthalmology and, to the writer's knowledge, the first use of the mild dosage. Varying reports from different observers followed until 1900, when Schieck's exhaustive report appeared. He, working in the Halle clinic under von Hippel, reported five cases of ocular tuberculosis, partly treated by T. O. and partly by T. R., recovery taking place in all cases. His report also collected the literature of all the previously reported cases of tuberculosis of the iris and found 103 eyes treated by the older methods. Of these eyes, 39 were cured and 64 lost—a percentage of cure of 37.8. In 13 cases treated with tuberculin all were cured—100 per cent —not a single eye coming to enucleation, not only the form of the eye being saved, but also some of the function. Also, so far as could be determined, neither the retention of the eye nor the use of the injections caused any damage to the general organism. Schieck's efforts to confirm these observations by animal experimentation were uncertain and even unfavorable. Although his work did not attract the attention which it deserved, soon afterward tuberculin began to be used again with increasing satisfaction in ophthalmology, and numerous observations on tuberculin therapy have been recorded, but it is due to von Hippel more than to any one else that this form of treatment has been so extensively adopted in this disease of the eye. He was led to its use by the belief that the unfavorable reports from its general use did not hold in ocular tuberculosis, that in many of these cases tuberculosis elsewhere could not be detected, that in ocular tuberculosis the number of bacilli in the tissues were few, and that thus the danger of metastasis was slight. He began with the injection of 1-500 mg. of the dry substance, repeated every second day, taking the temperature every two hours, increasing each time 1-500 mg., later increasing the dose more rapidly if the temperature showed no rise above 38° C., in which case the same dose was continued for two or three doses and increased only when the patient showed no reaction. It is unnecessary to go above 1 mg. To obtain a perfect cure it is often necessary to continue the treatment six months or longer. Injections must be continued until all signs of inflammation, precipitates or opacities have disappeared. As eye infections may be of human or bovine strain, in some cases bovine T. R. may be better than human. If the eye disease is secondary to a glandular infection, a bovine preparation should be used. If secondary to a pulmonary infection, a human product should be employed. Zur Nedden says that the process is one of active immunization, so that we can expect a cure only when the body possesses the power to react in the right way to the injections, neither do all tubercular diseases of the eye offer the same promise of cure. It is generally recognized that conjunctival tuberculosis is most resistant to tuberculin injections, and that of the bulbar forms those of the chorioid are most resistant. Darier suggests that when a local reaction of dangerous severity occurs in the eye, it can be controlled by subconjunctival injections of guaiacol. Stock observed the frequent tuberculous origin of chronic iridocyclitis and recommends T. R. strongly in its treatment, but finds a chronic disseminated chorioiditis less favorably influenced. Allen reports good results in chorioidal tuberculosis and in infection of the orbital bones. The author then gives a description of the various tuberculin preparations and of their dosage, a list of cases tabulated with detail of treatment and result and a full bibliography.

A. F. A.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(GREAT BRITAIN AND THE ENGLISH COLONIES.)

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A Case of Tumor of the Pituitary Body.

BOYD, WM. (*Lancet*, October 15, 1910). Patient a man 36 years of age, who eight years before began to suffer from severe neuralgic pains in left temple and later in right. Eighteen months later vision began to fail in O. S. and six months later in O. D. Ocular conditions were treated with K. I. but steadily became worse. Three years later developed epileptic seizures with no aura. During same year several mucous polypi were removed from both nostrils. One year later became somewhat ataxic and had several attacks of acute mania. The last two years patient had been gradually more dull, stupid and lethargic. Was becoming more and more deaf and had had a discharging right ear for years; this was cleared out but no improvement. Patient had gained weight all this time and eyes were more prominent than a few years before. On admission, owing to his mental condition, it was hard to obtain accurate tests, but the following was elicited: There was weakness of all the intrinsic muscles of the left eye, the weakness being most marked in the superior rectus, internal rectus, and inferior oblique. The pupils were medium in size, equal, regular and reacted well to accommodation, the reaction to light was very sluggish in the right eye and completely lost in the left. There was complete amblyopia, and doubly primary optic atrophy, this primary atrophy having also been observed in 1905 by Mr. Holmes Spicer at St. Bartholomew's Hospital. The blindness being complete no observations could be made on his fields of vision, but fortunately some observations made in 1903 were available. These show that at the time the left eye was only capable of perceiving hand movements, while the right field of vision presented a beautiful example of hemianopia, the temporal half of the field being quite blind. At that time he is reported to have had chorioiditis in both eyes. The earliest note of his ocular condition was in May, 1902, when his vision was normal and his fundi presented no unusual appearances.

The patient died suddenly shortly after admission to the hospital. At the post-mortem examination there was found: At the base of the brain there was a large, soft, friable, vascular tumor of a fleshy color, which was growing downwards into the sella turcica, from which cavity it had to be torn before the brain could be removed. A mass of pulpy vascular material, not unlike red currant jelly, was left in the pituitary fossa. The tumor was then seen to be growing from the infundibulum, this being the only point at which it could not be separated from the brain. It was invested by a thin delicate membrane, which, however, had been torn away in places, leaving a granular surface exposed. In consistency it was gelatinous and was in places almost cystic. Its length was 7.2 cm., its width 3.3 cm., and it extended from the optic chiasma to the middle of the pons, occupying rather more of the left than of the right side. The optic chiasma had been crushed out of recognition, the crura widely separated, and the pons greatly distorted. The most striking

changes, however, were those in the floor of the skull. The sella turcica had developed into a large cavern 6.5 cm. long and 4 cm. wide. Opening out of it on either side was an oval aperture, that on the left side proving, on investigation, to communicate with the antrum of Highmore of that side. Thus the discharge from the left nostril, observed during life, was in reality an escape of cerebrospinal fluid from the cranial cavity. The fossa had no bony floor, but merely a membranous partition separating it from the cavity of the pharynx.
N. M. B.,

Early Recognition of Choked Disk.

Bordley, James, Jr. (*The Ophthalmoscope*, January, 1911). The author describes in detail the early appearances of choked disk, and the points distinguishing it from simple hyperemia, pseudopapillitis, and the optic neuritis depending on local injury or disease. He also dwells upon the importance of dyschromatopsia as confirmatory evidence of brain tumor.

Choked disk, he believes, is the most common symptom, headache excepted, of tumor of the brain, and agrees with the statement of Gowers that "the value of optic neuritis as an indication of intracranial tumor is very great. In at least four-fifths of the cases of tumor it may be the only unequivocable sign."

In spite of the fact that he, with Dr. Cushing, found the greatest change in the optic nerve on the side homolateral to the tumor, a great number of instances where the tumor is on the contra-lateral side casts a doubt on the value of choked disk as a means of localization.

While it is impossible to determine with any degree of accuracy the location or nature of a tumor by the pathological alteration in the optic papilla, choked disk is, however, of sufficient importance as an indication of progress in the morbid growth and its consequences.

The recognition of incipient choked disk from simply hyperemia is often difficult. Incipient choked disk is, in reality, not simple hyperemia, but congestion with edema. Certain changes strongly suggest the presence of edema, as dilatation of the minute vessels lying between the nerve bundles, the difference in color between the swollen vessels and the cloudy tissue often resulting in striping. The stripe in the edge of the normal disk differs in the absence of vascular distension. The actual elevation of the disk is difficult to determine, owing to the fact that the papilla lies in a plane anterior to the surface of the retina. In edema there is a diminution in the width of the cup, therefore an elevated disk with a narrow cup should be looked upon with suspicion. The cup also becomes more shallow in the initial stage, owing to the swelling of the sides of the excavation and the lamina cribrosa. One of the first signs of edema is the rounding off of the nasal edge, and an increase in height of the temporal margin of the cup. In common distinction to simple hyperemia, in which the tortuosity of the vessels is shown by long curves lying flat on the retinal surface, the arteries in incipient choked disk are usually of normal size, and but slightly if at all tortuous. The sudden appearance of an abnormal number of small veins on both disk and retina is also very suggestive of edema.

The chief point of difference between choked disk and the so-called "pseudopapillitis" is in the non-progressiveness of the latter. In some cases the picture has remained unchanged for years, probably a mere congenital anomaly. In "pseudopapillitis" the physiological cup is narrow and deep and its angular edges cut into the central vessels so sharply that, as the result of foreshortening, they disappear from view. The retinal arteries are, as a rule, more tortuous than the veins, and the curves of both are less abrupt than in the true form. The arteries are not buried in the surface of the disk in a manner similar to that found when the disk is elevated two or more dioptres from edema, nor does an examination of the retina reveal, beyond the tortuous vessels, anything unusual.

The writer is convinced that optic neuritis is by no means as common as supposed, and many cases represent either an incipient or declining choked disk. Ophthalmoscopically, it usually differs from choked disk in that the disk is elevated but slightly, if at all. Its surface is blurred by exudate deposits and the clearness of the nervous-vascular elements of the disk, so characteristic of choked disk, is wanting. Perivascular changes which occur late in choked disk are found early in neuritis. Optic neuritis is more apt to attack but one nerve, while choked disk in the majority of cases involves both.

As has Friedenwald, the author has been impressed by the astonishingly rapid failure of vision, associated with but slight visible changes in the disk in true neuritis, while in choked disk there is seldom serious visual disturbance without the choking becomes intense or declines with atrophy.

Dyschromatopsia was found quite constant as the symptom of brain tumor. The predominant feature in most cases was the alteration in the lines which represented blue, while the fields, both for form and colors, were in some cases concentrically contracted, almost invariably the greatest loss was in the blue field. At times there was interlacing of the lines for red and blue; at others the blue was found inside the red, and still less frequently entirely lost. The usual manner in which the change in the blue field was brought about was by the formation and fusing of peripheral scotomata.

W. R. P.

Radium Therapy in Eye Disease.

Lawson, Arnold, and Davidson, J. Mackenzie (*Brit. Med. Jour.*, November 12, 1910). The authors, in a very thorough and valuable essay on the subject, begin by describing their methods. The eye is cocainized and radium in sealed glass tubes, permitting only the passage of the Beta and Gamma rays, is applied directly to the affected part. The operator's fingers are protected by wrappings of lead foil. Forty-six cases are tabulated and details of the treatment given. No single instance has been observed of ill effects from the use of radium. No increase of inflammation has occurred in a single case. Five minutes' exposure was given, as a rule, though Mackenzie Davidson, in treating a case of rodent ulcer, found that a tube of twenty or thirty milligrammes could stay for one-half hour on the lid without causing any ill effect to the eye. The frequency of the exposure was determined by the nature of the case, but if a large dose was used, a week was generally allowed to elapse between treatments. The immediate effects to the eye were practically nil, slight photophobia and irritation. A few hours after the sitting, some patients complained of pain, which in a few instances was severe enough to cause a sleepless night. Usually this passed off within twenty-four hours, but in one or two instances it lasted for several days. Only one case had retinal symptoms. The patient was suffering from an attack of episcleritis, and a large amount, 50 mg., was applied for five minutes to the sclerotic. For two hours the patient noticed flashes of light.

After the first irritation of the treatment has worn off, the subjective symptoms speedily improve, and pain subsides. "This speedy anesthesia, if it may be so called, is a very striking feature of the treatment." The scars formed in certain cases are perfectly supple and smooth and show no tendency to cicatricial dragging. In the treatment of ulceration of the cornea, especially of intractable cases, the results were universally good, with one exception. Certain non-ulcerative acute inflammations of the cornea and sclera were treated. Seven cases of interstitial keratitis were treated, and one or two rather striking results were obtained. Spring catarrh was very successfully treated. Corneal nebulae did not improve much, but the authors think that a more extended effort should be made in this class of cases. E. S. T.

A Case of Bilateral Papilledema and Ring Scotoma Due to Sphenoidal Sinusitis.

Wood, C. G. R., and Wallis, G. F. C. (*Lancet*, September 24, 1910). Female, age 29, good family history. Past history: In summer of 1906 had been seized with a sudden and severe frontal headache which continued with short periods of remission up to November, 1908, and then as suddenly ceased. These were severe enough to confine her to bed, but unassociated with nausea or vomiting. General treatment being of no avail, all her teeth had been extracted, but without result. Had had an attack of influenza in 1907 and slight enlargement of thyroid with no symptoms.

In September, 1909, came complaining of defective vision for two years with intervals of improvement. When the patient was seen in September, 1909, R. V.=6/9. Left V=hand movements. There was concomitant divergence of the left eye, but convergence was unaffected, and there was much edema of both disks, but no hemorrhages. In November, 1909, she was admitted an in-patient, the ophthalmoscopic condition being unchanged. The modified Burnham treatment was carried out for twelve days, at the end of which time, when she left the hospital, R. V.=6/6, L. V.=6/36, and the optic neuritis, though less in degree, was still marked.

Shortly after returning home she suffered from severe frontal headache, which lasted a fortnight and ceased suddenly.

In January, 1910, the patient was readmitted, when R. V.=6/9, L. V.=perceptions of light in the temporal field only; the external appearances were unchanged, but there was slight tenderness on pressing the globes backwards. The pupils were equal, reacting to light and convergence. Wernicke's hemianopic reflex was easily elicited on illuminating the temporal and nasal halves of the left fundus. Ophthalmoscopically, the media was clear and there was papilledema in both eyes—right + 3 D., left + 4 D. The arteries were threadlike and the veins very engorged with slight retinal edema, particularly in the left; there were no hemorrhages or perivasculitis, and nothing in the fundus to explain the left visual field. The visual fields: White and red were markedly contracted, especially inferiorly in the right eye, and the green, and the left showed extreme concentric contraction, but in spite of this there was no central scotoma. In the left eye there was only a small island of vision remaining in the temporal field. As regards the nasal conditions, anteriorly and posteriorly, on both sides the middle and inferior turbinates were engorged, especially the left, but pus was only seen upon the middle turbinates posteriorly; both the frontal and antral sinuses transilluminated well. The nervous, vascular and hemopoietic systems appeared healthy and there were no signs of plumbism.

No other cause being found, a diagnosis of optic neuritis due to sphenoidal sinusitis was made. The modified Burnham treatment was again carried out for a few days, when pus was seen in the right superior meatus anteriorly. Both middle turbinals were now removed as a preliminary to opening the sphenoidal sinuses. This was followed by a small rise in temperature for about ten days, at the end of which time both sphenoidal sinuses were opened and mucopus was found. Sixteen days later R. V.=6/6, L. V.=6/12.

On May 12, 1910, by rhinoscopy, anteriorly the nose appeared healthy, but posteriorly there was still a little pus upon both middle turbinals. Ophthalmoscopy showed that both of the disks were still slightly blurred, but there was no exudate or atrophy. In the intermediate zones of the retinae there was some grainlike patches of pigment. Small doses of vinum antimoniale and potassium iodide were now given. On the 27th R. V. = 6/5, L. V. = 6/9.3. The retinal haze had cleared in each eye. The visual fields showed very marked improvement in the right eye, particularly in the inferior quadrants. There was a typical complete annular scotoma in the left, and in the small area of central vision a relative scotoma for green. On June 27th the patient stated that she saw better and had had no recurrence of headache. The ocular and nasal condition was unchanged. The visual fields showed that the central scotoma had disappeared in the left, but the fields in both eyes, although slightly more extensive, retained the same characters.

Optic neuritis is not infrequently observed in sinusitis, but choked disk, especially in so marked a degree, is uncommon. Risley reports a case of unilateral choked disk set up by ethmoiditis in a boy of 11, and Fish records two cases which were probably choked disk, one bilateral and one unilateral. These cases are of interest, in view of the present-day tendency to open the skull on account of papilledema, which on more careful investigation may prove other than cerebral in origin; and Fish states that one of his patients with bilateral optic neuritis, which he believed due to sinus disease, was trephined and optic atrophy resulted. N. M. B.

A Study of the Pathological Histology of Trachoma: The Trachoma Bodies.

McKee, Hanford (*Ophthalmoscope,* January, 1911). The pathological histology of trachoma is described from the examination of tissue taken from twenty-five adult patients, all of whom had clinically active trachoma. No material for this part of the work was taken from children, infants, or old cases with scar formation. The cell inclusions described by Halberstaedter and Prowazek as "trachoma bodies" are also discussed, especially in regard to their specificity.

The anatomical changes in granular ophthalmia, or trachoma, consist in (1) papillary hypertrophy of the conjunctiva of the lids, (2) the development in the conjunctiva of granulations which, in the retrotarsal fold, are characteristic.

The pathological histology naturally centers about the granulomatous or hypertrophied lymphoid follicles which, though they may vary in character, are always present. These large and small masses were sometimes so numerous and large that they fused with neighboring ones, making the section one dense mosaic of cells.

The lymphoid follicle in trachoma was found to differ from collections of lymphoid cells in chronic inflammatory conditions, in that (1) it is composed of large cells, with vesicular nuclei, identical with those in the germinal centers of lymph nodes; (2) many of these cells are in mitosis; (3) the lymphoid follicle of trachoma has a definite reticulum; and (4) capillaries are present.

A brief resume is given of the original work of Halberstaedter and Prowazek, who in 1907, after staining smear preparations with Giemsa, found near the nucleus of the epithelial cells, round or oval, dark blue or violet, non-homogeneous masses. Within these bodies, with good staining, they found very sharply defined small bodies, staining a red color, which they believed were microorganisms. They also found within the cells blue-stained masses, which they believed were the result of the reaction of the cell to the invasion of the virus, and called them "plastin clots."

Findings of other authors are also reviewed. Of particular interest is the work of Heyman, of Breslau, who found the characteristic cap-like trachoma bodies in large numbers in nine cases, five of which were instances of active trachoma and four gonorrheal ophthalmia. The diagnosis of the latter was established bacteriologically and the possibility of trachomatous infection carefully excluded.

The mode of examination was as follows: An ordinary ear curette was used to scrape the conjunctival surface gently without causing it to bleed. The material obtained was then smeared over a glass slide, allowed to dry in the air, and then fixed in 80 per cent alcohol for fifteen or twenty minutes. The slide was stained with one drop of Giemsa solution, to which twenty drops of distilled water were added, for one hour. It was then washed, dried in the air, and examined in the usual way.

By this method the cytoplasm of the epithelial cells is left clear or a very faint pink. The nuclei of the cells are a definite pink or red color; the nucleoli are more deeply stained than the nuclei. When present, the trachoma bodies are seen as a mass of dots stained a deep blue. Only close examination will show the blue-stained mass separated into tiny dots, which look not unlike tiny diplococci. In the center of these masses one may find some dots which have taken a red stain.

The bodies, as a rule, are closely related to the nucleus, covering it like a cap, but one may also be found some distance away from it. They also vary in size from the single dots to groups occupying the whole cytoplasm of the cell.

In twelve cases of clinically active trachoma, the trachoma bodies were found in eleven, the negative case being an early case—the first one examined. In two cases where the clinical appearance was identical with active trachoma, but where diplobacilli were present in large numbers, no bodies were found. The diplobacilli of Morax-Axenfeld is able to set up a condition which can only be differentiated from trachoma by bacteriological methods. In six cases of old trachoma, with scar formation with pannus, the examination was negative. Preparations from other mucous membranes from normal and inflamed tonsils were negative in ten instances, only one case showing inclusions somewhat similar in position and staining reaction. In five examinations of the vaginal mucous membrane, the result was negative.

The following conclusions were drawn:

1. The trachoma bodies of Halberstaedter and Prowazek are constant in acute trachoma.
2. That the inclusions are protozoa and the cause of trachoma we do not believe proved, but as yet we are unable to offer any suggestion as to the nature of these inclusions.
3. The trachoma bodies are not specific for trachoma.
4. They occur in other conjunctival inflammations and in the normal conjunctiva. To what extent they are present in non-trachomatous eyes is only now being worked out.
5. The etiology of trachoma is still undiscovered.

W. R. P.

Notes on the Bacteriology of a Case of Purulent Keratitis.

Traquair, H. M. (*Ophthalmoscope*, January, 1911). A case is reported of purulent keratitis, in a man 58 years of age, following a blow on the right cornea from a chip of stone.

The eyelids were reddened and edematous, the conjunctiva was swollen and congested, the bulbar portion being intensely chemosed so that it overlapped the corneal margin all round. The upper and inner quadrant of the cornea was occupied by an oval yellow area of dense sloughy tissue, 6 mm. high by 4 mm. across, touching the limbus at its upper-inner margin. At the upper and inner part of this area there was a small hole, less than a millimeter in diameter, which opened into a space enclosed between the slough in front and the corneal tissue behind. The remainder of the cornea was clear, with the exception of a small, greyish, deep infiltration at the outer side of the sloughy area near the limbus. The pupil was moderately dilated. as the patient had been using atropin for two days.

A hypopyon of 2 mm. was present. The ulcer improved under treatment by zinc iontophoresis for three days, and the greater part of the slough disappeared. On the fourth day the process seemed to be spreading, but was checked by another application. The infection spread deeply into the cornea, especially at the upper and outer part, and perforation occurred. Healing set in after the third application of zinc, and on the 30th day the eye was well with a moderately dense but extensive scar. Good anterior chamber and vision equal to fingers at half meter, after subsequent iridectomy.

Bacteriologically, three varieties of cocci were isolated. The first appeared as a Gram-positive diplococcus. composed of rounded or slightly elongated individuals. Short chains only of four to twelve members were found. The large capsules and size of the cocci, and their cultural characteristics were taken as strong evidence that the organism was a genuine streptococcus mucosus. The other two varieties. except for slight though definite differences in the appearance of the colonies, were practically indistinguishable, appearing as simply Gram-positive cocci about one-half the size of the first variety, forming chains and aggregated masses. The chains were mostly long, but varied from a few members up to over 100. There were regarded as intermediate forms between the pneumococcus and the streptococcus pyogenes.

Infection of the eye by streptococcus mucosus has been seldom observed as yet, and not hitherto in purulent keratitis.

W. R. P.

A Case of Hemianopia.

JAMES, R. R. (*Ophth. Rev.*, November, 1910). Hemianopia occurring as an isolated complication of head injury is of great rarity, and this fact has induced me to publish the notes of a case of homonymous hemianopia which I first saw on September 11th, 1909, and which appears to me to have a great deal in favor of its having been caused by the injury, although of course I cannot adduce any positive proof that such is the case, as the patient is still alive.

The patient was a woman 58 years; came to clinic complaining that since an accident received two months before, the result of a train colliding with an omnibus, she being thrown from the roof, striking on her right hand and right side, she experienced difficulty in seeing things situated on her right side. This was first noticed when she began to get about after her injury. Immediately after injury she was taken to the receiving room of a large hospital where her cut head was sewn up, and her Colles' fracture of the right forearm put up on the usual splints. She was then sent home in a cab. Feeling sick while in the cab she asked her friends to call in her own doctor when they reached home, and on this gentleman's arrival, he found the patient unconscious. He advised her removal to the Westminster Hospital, where she was admitted suffering from fractured base, with bleeding from the nose and right ear, and considerable ecchymosis round the right eye. She lay unconscious in hospital for five days and then slowly recovered.

When I first saw the patient, I found a healthy looking woman, whose eyes were rather prominent; she had a freshly healed wound about one inch in length over the external angular process of the frontal bone on the right side, extending inwards above the right eyebrow, the skin was quite supple and was not attached to the bone beneath. I made a note that the left pupil was a shade larger than the right, that the pupil reactions and the intraocular tension were normal.

R.V. 6/6 Hm. 0.5
——————— +3.5 sph.=Sn.0.4 very slowly, fundus normal
L.V. 6/6 Hm. 0.5

Right-sided homonymous hemianopia, the division line avoiding the macula. Wernické's reaction not present.

Slight general contraction of the field on both sides.

Dr. Golla kindly examined her general condition for me, and reported that he could find nothing else the matter with her, and that her blood pressure was not unduly high.

I saw the patient occasionally during the next few months, and examined her carefully again on September 30th, 1910. Her condition presented no change, the fields were unaltered; the fundus normal. She was able to divide straight lines with fair accuracy, not making the mistake described by Liepmann, of making the half lying on the side of the retained field too large.

The injury must have affected some part of the optical fibers behind the corpora quadrigemina, and most likely the occipital lobe itself, for one knows how often in fractured skull that part of the brain immediately opposite is the seat of fracture and laceration. N. M. B.

Myopia Developing at 26 Years of Age.

MUNRO, C. (*Ophth. Rev.*, September, 1910). Patient came to me on 19th of March, 1910, complaining of headaches and deterioration of distant vision, during the last few months. He was a well-developed man, living an out-of-doors life—he was a Sowar in a native cavalry regiment; age, about 26. Until recently he was an expert signaller, passing "first class" in the 1908 and 1909 regulation tests, a feat, for the accomplishment of which extremely good distant vision is required. During the last six months he has had increasing difficulty in seeing the signalling flags, and, in his 1910 test, he failed completely.

On examination, V.A. in both eyes was found to be 6/18. The fundi were normal in appearance. By retinoscopy, 3D and 2.75D of myopia were made out in the right and left eyes respectively, combined, in each case, with .5D astigmatism "against the rule." The necessary correcting glasses improved the V.A. to 6/6 in both eyes. N. M. B.

The Etiology of Iritis.

BEAUMONT, W. M. (*Brit. Med. Jour.*, December 17, 1910). The author refers to his contention, previously published, that rheumatic iritis is rare, and insists that rheumatism as a causal factor is by no means clearly proved in many of the cases that are so classified. He argues the question at length, according to well-known clinical facts, and says that in his last eighty cases of iritis there were but four who had suffered from acute rheumatism at some previous time. He contends that toxemias of all descriptions are frequently overlooked.

E. S. T.

Injuries to the Eye.

PERCIVAL, ARCHIBALD STANLEY (*Brit. Med. Jour.*, October 22, 1910). This article gives a resume of certain practical points in the removal of foreign bodies from the cornea, the treatment of wounds of the cornea, and sympathetic ophthalmia. The author advocates replacement of iris prolapse, if seen within two hours of the injury, by the use of eserine, pilocarpine, or atropine, depending on the situation of the corneal wound, "aided, if necessary, by a little prodding with the repositor." Replacement is hopeless twelve hours after the injury.

E. S. T.

Congenital Blennorrhea of the Lacrimal Sac.

FOSTER, J. (*Ophth. Rev.*, September, 1910). The subject of blennorrhea of the lacrimal sac in the newly born has not received the attention it deserves; it is due to catarrh of the mucous membrane of the sac, which, owing to obstruction somewhere in the nasal duct, most probably where it opens into the inferior meatus of the nose, results in accumulation of mucopus or pus in the lacrimal passages above the stricture; this leads to distension of the sac, which discharges its contents through the lacrimal puncta, into the conjunctival sac, when pressure is made over the region of the lacrimal sac.

The author thinks that the expression treatment, if properly carried out, is quite sufficient to cure absolutely the great majority of cases.

N. M. B.

The Operative Treatment of High Myopia.

THOMPSON, A. H. (*Ophth. Rev.*, November, 1910). For two reasons the effect of removing the lens from a highly myopic eye is always much greater than 12D.

One reason of this is that in a myopic eye the distance from the lens to the retina is greater than in an emmetropic eye and the greater this distance is the greater the effect on the total refraction of removing the lens. Another is that the concave glass which corrects a patient's myopia is placed at a greater distance from his retina than the convex glass which corrects the hypermetropia of a patient who has had his lens removed for cataract, and the further off from the retina that a concave glass is placed the less is its effect in altering the refraction. I conclude that the average refraction in myopia after removal of the lens is half the previous myopia plus a figure which varies between 9 and 13, but which on the average is 10.5.

The author regards —16 D. as a reasonable limit higher than which it is justifiable to operate in cases otherwise suitable.

It is seldom advisable to operate beyond the age of 40 for two reasons: First, that the lens matter does not absorb so readily after needling and we are more likely to have to extract with a possible loss of vitreous; secondly, that the myopia is far more likely to be complicated by advanced chorioiditis or macular degeneration, conditions which are distinct contraindications to the operation. The very young patients on the other hand usually do well.

The author agrees with previous investigators who have concluded that in itself the operation has no effect either one way or the other in either hastening or delaying the tendency of the axis of the eye to increase in length, though this tendency has only about half the effect on refraction in the case of an aphakic eye to what it has in the case of an eye with the lens intact.

In myopic eyes, a crescent, however large, so long as its margin is well defined, is no evidence of a tendency to chorioiditis. An irregularly defined crescent, on the other hand, or irregular areas of chorioidal atrophy outside the crescent, or any definite changes at the macula do show a tendency to disease, and so do vitreous opacities. These ought, in my opinion, to be contraindications to operation, although not necessarily absolute ones in cases where the changes are only slight. To operate on an eye which is very likely to go to the bad anyhow is certainly unwise, however, and it is quite possible that when an eye is in this condition the influence of operative procedures may hasten the tendency. A great many of the published cases in which detachment of the retina has occurred have been cases with unhealthy fundi or vitreous opacities. On the other hand I do not think there is any evidence to show that the operation tends to cause chorioiditis or macular disease in the eyes which have previously been free from them.

Highly myopic eyes can never be considered to be free from these dangers.

In most cases of high myopia the two eyes are approximately equal, and it is generally wisest to choose the one in which the myopia is highest for operation. In two of my cases the myopia was very unequal, the myopia in the second eye being in one case —11.5 against —20, and in the other —4.5 against —17.5. In this sort of case the patient appreciates the benefit he gets from the operation, provided that it enables him to see fairly well at a distance with the operated eye without any glass, even though the vision of the second eye with a glass may be somewhat better. In cases on the other hand where the second eye is emmetropic or nearly so, there is really nothing to be gained from operation at all. Further, in cases where the fundus of the second eye is seriously diseased, and more especially if there is a detachment of the retina, the chances of both eyes behaving in the same way are so great that I do not think that an operation ought to be performed without very special reasons indeed.

There are three possible methods of dealing operatively with the lens in young myopes:

1. Repeated small needlings, until the whole of the lens matter is absorbed. This is a tedious method as the number of needlings may have to be considerable and the duration of the treatment correspondingly prolonged.

2. One free needling calculated to cause rapid imbibition of aqueous by the lens and consequent swelling of the lens matter. If this method is adopted it is in almost but not quite all cases necessary to perform a second operation in from three to ten days' time to evacuate the lens matter artificially. This is the method that I have adopted in all but one of my cases. In many cases, when the whole remaining lens matter is absorbed, there is a partially opaque posterior capsule left which requires needling.

3. The third method is linear extraction of the lens without a preliminary needling at all. To my mind the great objection to this procedure is the danger of vitreous loss. I have only adopted it in one case when there was congenital dislocation of the lens and where I found it impossible to needle the lens effectually. I did in fact lose a little vitreous in this

case, but fortunately no detachment of the retina has followed.

The author obtained improvement in vision in all but three cases. One case he would not now consider suitable for operation on account of macular changes in both eyes. This was his first case and each operation was followed by cyclitis. Another case, successful at first, having vision three years after operation of 6/XII and Jaeger I, and it was not until five years after operation that vision failed, the cause being a thick crop of "K. P." The third case, vision was reduced eight months following the operation by a macular hemorrhage which reduced the vision to not quite as good as it had been with the myopia corrected.

Of the remaining seventeen eyes operated on, on the last occasion on which they were seen—in ten cases the distant vision without a glass was either equal to or better than what it had previously been with a correcting glass; in the remaining seven it was equal or better with the help of a low plus glass—in some cases very considerably better. In all these cases the patients themselves have been pleased with the result.

With regard to near vision, I have found that in five cases the patients preferred to use their operated eye for all purposes with or without a glass; in eight cases, however, the patient preferred to use the unoperated eye for near work. This is a point which must be borne in mind if it is ever a question of operating on the second eye.

In any case this should certainly be deferred for two years after completing the operation on the first, and if the second eye is useful for near work it should of course be left as it is.

Cases may do badly either as the direct result of the operative procedure or from causes entirely unconnected with it. The first class of failure includes (1) cases of infection. Hypopyon or even panophthalmitis may follow from this as from other operations on the eyeball. (2) Secondary glaucoma, either from failure to let out the lens matter soon enough after a needling or at a later period from causes which are obscure. (3) Cyclitis leading to a thick cyclitic membrane as in my first case.

The second class of failures includes eyes that go wrong in consequence of macular degeneration, extensive chorioiditis or hemorrhages. These are incidents liable to occur in these highly myopic eyes at any time and do not appear to be more frequent in eyes that have been operated on than in eyes that have not.

There is still one cause of failure which is so important that I will treat it separately; I mean detachment of the retina. This is also an incident in the course of high myopia, and a certain number of cases which have occurred after operation would have happened to the same eyes even if no operation had been performed. N. M. B.

Miners' Nystagmus.

Elworthy, H. S. (*Brit. Med. Jour.*, November 19, 1910). The author begins by calling attention to the fact that miners' nystagmus is a disease peculiar to coal miners. Neither in the Cornish tin mines nor in the lead mines of the Isle of Man does it occur. He considers it a fatigue symptom, resulting from working in the absence of all contrasting colors or "color relief." The constant glare of the lamps is also a contributing cause. When a certain stage of exhaustion is reached, co-ordination is lost, and spasm sets in. Lastly, the accommodation fails. The spasms are clonic, either regular or irregular, and are confined to two opposing muscles, or the whole head may be in a state of tremor. It seldom appears until the miner has been working for some years. There is a primary latent stage, with nystagmic movements, of which the patient may be unconscious. Then appears, often as the result of a sudden fright, a sudden loss of co-ordination, with dizziness, blurring and headaches. The movements are classified as lateral, vertical, rotatory, mixed, oblique, axial rotation and nictitation. The mixed cases—those in which the greatest inco-ordination exists—take the longest to recover. The treatment is divided into preventive, under which the author considers that some hours of change in the daylight is necessary; whitewashing some of the posts of the headings so as to secure color contrast, shading the eyes from lamps, etc.; and curative, which consist mainly of rest, nerve sedatives, colored glasses, and, possibly in some chronic cases, the use of electricity. E. S. T.

Miners' Nystagmus and Formic Acid.

Ohlemann, M. (*Ophth. Rev.*, November, 1910). I should like to add some observations on this subject, from my experience in the mining districts of Bothum, Westphalia. In this region the number of cases of nystagmus, among miners, is very large; fresh cases are seen almost every day. I chose twelve cases, three who had suffered from nystagmus for more than two years, three less than two years, the others of recent origin. All the men were off work, and I treated them all with formic acid, in doses similar to those mentioned by Dr. Percival, for a period of three weeks. This treatment was entirely unsuccessful in every instance. One patient alone said he thought his eyes were better, but my belief is that the improvement was due to the rest he had had; his case was the most recent. In all cases in which improvement occurs, underground work is given up, the patients have a complete rest, and afterwards are employed in work above ground.

In examining patients in this stage (after a complete cessation of mining work) the nystagmus may not be noticeable except when the eyes are directed upwards, and sometimes only in a darkened room.

After a rest of varying duration, depending on the length of time the disease has been present, the age and strength of the patient, and perhaps his habits as to alcohol and tobacco, some patients are able to resume work underground. Generally, however, a return to work in the mine is followed by a relapse of the disease. I have also tried treatment by strychnia but without success. My belief is that no drug has yet been shown to be capable of curing the condition, and that rest is the real cause of the improvement noted in many cases.

N. M. B.

A Case of Mikulicz's Disease.

Elliott, Major R. H., and Ingram, Captain A. C. (*The Ophthalmoscope,* February, 1911). A case of Mikulicz's disease is reported in a female Hindu, aged 49, in which the lacrimal, parotid and submaxillary glands were involved.

The patient gave a history of "sore eyes" ten months previous, which was followed ten days later by a small painless swelling about the size of a bean over the seat of the right lacrimal gland. Eight days later a similar swelling appeared on the left side. Both grew steadily until at the time of examination both lacrimal glands were so much enlarged as to almost give the appearance of blunt horns.

In dimensions the right measured 40×25×16 mm., and the left 36×23×15 mm., both freely movable, almost as hard as cartilage and admitted of a fair amount of movement on the deeper structures. They were rather irregular and presented a granular surface. The accessory portions of the glands were also enlarged, projecting down into the conjunctival sac. There was a distinct drooping of the lids and the eyeballs were pushed to one side. The movements of the eyeballs were limited on all sides, but especially of the left eye upward. The parotids, submaxillary and sublingual glands were all distinctly enlarged. Blood and urine examination were negative.

Both glands were removed by an incision parallel to the eyebrow, and the tumor shelled out. The appearance of the gland when removed was convoluted, suggestive of the surface of the brain.

Infection of the wound followed removal of the left gland, which involved the conjunctiva on that side, and was attended by a distinct increase in the fullness of the corresponding parotid gland, as well as in the submaxillary and sublingual. The tumescence disappeared as the wound cleared. Following the removal of the lacrimal gland there was a distinct decrease in the size of the other glands involved.

The pathological examination was made by Captain Ingram. The histological appearances were those of multiple cellular growth affecting a number of glands, presenting some resemblances to lymphoid tissue, but showing some definite points of difference, so that the term "lymphomatous" was suggested as the most suitable in the present state of our knowledge.

W. R. P.

Some Unusual Manifestations of Infection With the Klebs-Loeffler Bacillus.

Butler, T. Harrison (*The Ophthalmoscope*, February, 1911). Four cases are cited of infection of the eyes with the Klebs-Loeffler bacillus, in which a purulent process developed instead of a characteristic membranous conjunctivitis.

Case 1.—Patient had intense edema of both upper and lower lids, and the tissues over the lacrimal gland of left eye, for past three weeks. Abscess pointed at outer canthus, which yielded much greenish pus upon incision, from under the periosteum covering the malar bone. The case rapidly recovered. Bacteriological examination showed Klebs-Loeffler bacillus.

Case 2.—A child with whitlow on forefinger developed an acute conjunctivitis of the left eye and pustular eczema of the lower lid, with much edema of both lids. The case presented the picture of a staphylococcal infection of the eye associated with the whitlow. Bacteriological examination revealed Klebs-Loeffler bacillus. Inflammation subsided at once when treated with protargol and perchloride lotion.

Case 3.—An optical iridectomy was performed for a dense central leucoma, with but little hope given of much benefit. In spite of precautions the eye became infected, the pus showing Klebs-Loeffler bacillus in pure culture. The ultimate end in this case was phthisis bulbi.

Case 4.—A man who had just been discharged from the hospital after enucleation of his eye, following an accident, returned with a purulent discharge from the socket. Examination of the pus showed Klebs-Loeffler bacillus.

A study of these cases leads to the conclusion that the Klebs-Loeffler bacillus may cause severe inflammations, which have no resemblance whatever to clinical diphtheria as usually seen in ophthalmic practice, and which are not associated with any symptoms of general toxemia. Without a careful bacteriological examination it would have been quite impossible to determine the etiology in the above cases. W. R. P.

Ophthalmic School Clinics in the Country.

Hird, R. Beatson (*Brit. Med. Jour.*, October 29, 1910). This article describes the author's methods of conducting the eye examinations in five schools, and gives statistics of the refractive conditions and diseases found. E. S. T.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

William Zentmayer, M. D.,

PHILADELPHIA.

Albert C. Sautter, M. D.,

PHILADELPHIA.

Frederick Krauss, M. D.,

PHILADELPHIA.

AND

Meyer Wiener, M. D.,

ST. LOUIS.

Concerning Ocular Anaphylactic Manifestations.

Kuemmel, R., Erlangen (*Archi. fuer Ophthal.*, Vol. 77, Part 2). concludes with the following summary:

1. It is possible by subcutaneous injection of heterogeneous serum to sensitize the eye also, making possible the induction of local anaphylactic manifestations.

2. Moreover, it is possible through the eye to sensitize the body generally, enabling the induction of general anaphylactic manifestations.

3. It is something possible by intravenous or subcutaneous injection of serum to effect a recurrence of an iridocyclitis which had resulted from a single serum injection into the eye or the induction of local anaphylaxis.

4. The eye may be sensitized locally and anaphylaxis locally induced in the same eye.

5. The hypersensibility induced in one eye may be made manifest in the other eye.

6. The anaphylactic ocular manifestations consist in an inflammation of the uveal tract. A. C. S.

The Changes in the Iris and Ciliary Epithelium After Puncture of the Anterior Chamber.

Carlini, V., Livorno (*Archiv. fuer Ophthal.*, Vol. 77, Part 1), submits the following conclusions:

1. The examination of living cells of the ciliary epithelium in isotonic serum or after staining with methylene blue, neutral red or brilliant-cresyl blue, or of specimens fixed and stained according to the methods of Mann, Altmann, Galeotti or with Heidenhain's iron hematoxylin, shows they contain neither secretory granules nor vacuoles.

2. The morphologic changes which occur in the ciliary cells after paracentesis are not the expression of increased cell activity, but of a rapid disorganization of the protoplasm. They consist principally in a vacuolization of the protoplasm leading to derangement and dissolution of the cell element.

3. The structural alterations resulting from puncture of the anterior chamber appear not only in the ciliary epithelium, but also, though considerably later, in the epithelium of the posterior surface of the iris.

4. The histologic investigations with the present exact cytologic methods indicate that the aqueous humor should be regarded a filtration product of the vessels of the ciliary processes and iris, rather than the result of a secretory action of the ciliary cells. A. C. S.

The Clinical, Physiologic and Pathologic Significance of Fluorescence in the Eye After the Administration of Uranin.

Burk, A., Kiel (*Klin. Monatsbl. f. Augenheilkunde*, October, 1910), studied the effect of the administration of uranin by the mouth in normal and pathologic eyes and thinks that much could thereby be learned from a diagnostic standpoint. The dose varied from 5 gram in adults to 3 to 4 gram in children, with no untoward symptoms aside from vomiting in a few instances resulting.

He found that diseased eyes associated with congestion were colored green much more than normal eyes.

The anterior chamber of a case of iritis is colored green, while in the normal eye it is not. Injection of the limbus and vascular parts of the cornea are strongly colored, extending in the latter a trifle beyond the visible congested area. Pannus is brilliantly colored. Erosions of the cornea unaccompanied by congestions are not stained. In one case the unilateral character of an optic neuritis was plainly shown by the yellowish color in the affected eye. In noninflammatory cases of optic neuritis this discoloration was absent. Diseases of the chorioid and vitreous body show fluorescence of the vitreous fluid.

F. K.

A Diploscope Deviometer.

BJERKE, Linkoeping (*Archiv. fuer Ophthal.*, Vol. 77, Part 3). The article is technical and cannot well be abstracted.

A. C. S.

On the Rapidity of Positive and Negative Convergence Movements.

INOUYE, Tokio, Leipzig (*Archiv. fuer Ophthal.*, Vol. 77, Part 3), summarizes the results of his investigations as follows:

1. The duration of symmetrical positive and negative convergence movements within an angle movement of each eye of from 1° 47' 35" to 11° 47' 35" ranges between .180 and .260 seconds.
2. The duration of both varieties of movement increases almost similarly with the size of the angle formed by the lines of regard; relatively rapid up to a convergence angle of 16 degrees, beyond which the increase is only just appreciable.
3. Positive convergence movements proceed more rapidly than negative movements of the same angle amplitude, the difference in rapidity between these two movements increasing with the size of the angle of convergence.
4. When the eyes, starting from different convergence positions, perform convergence movements of equal magnitude, these movements proceed the more slowly the more marked the convergence at the beginning of changing convergence.

A. C. S.

The Influence of the External Ocular Muscles upon Intraocular Tension.

LEVINSOHN, G., Berlin (*Archiv. fuer Ophthal.*, Vol. 76, Part 1). The results of animal experimentation and of tonometric measurements in human beings with Schiotz's instrument leads him to conclude that during near work no increase of intraocular tension ever occurs by reason of muscular contraction. The axial elongation in myopia can therefore not be attributed to the influence of increased tension and must follow other causes. Moreover, the anatomic changes in myopia, with the exception of enlargement of the globe and thinning of the sclera, are quite different from those complicating increased intracoular tension. A. C. S.

On the Regulation of Ocular Position by the Auditory Apparatus.

Bartels, M., Strassburg (*Archiv. fuer Ophthal.*, Vol. 77, Part 3). 1. *Paralytic strabismus in ear disease.*—Of chief interest is the abducens palsy complicating the so-called "Symtom de Gradenigo," an affection characterized by an acute, purulent otitis media, severe temporal pain and paresis or paralysis of the abducens on the same side. Gradenigo ascribed the muscle palsy to a localized meningitis. Other writers, however (Urbantschitsch, Rimini, Geronzi, etc.), believe this disturbance is occasionally produced reflexly from Deiter's nucleus.

While it is true that irritation of one auditory apparatus will cause rotation of both eyes towards the opposite side with more marked rotation of the adjacent eye, simulating thus an abducens palsy of that eye, this position endures but a few seconds, the strong fusion impulse in man overbalancing the auditory-ocular reflex. Bartels, therefore, concludes that paralytic strabismus in ear disease is the result of direct nerve lesion brought about by the extension of inflammation from the tympanic cavity or labyrinth to the meninges. Baldenweck holds the same opinion.

(While vertical deviations have as yet only been observed in animals, the author cites his own case as an example of probable reflex vertical deviation due to ear disease. While suffering with a marked serous hemorrhagic otitis media he had occasion to examine a patient with the ophthalmoscope, when the patient suddenly appeared to sink about a foot and a half and then rise again. He is at present studying this question experimentally in monkeys. He also thinks the systematic examination of ear patients for hyperphoria with the Maddox rod, etc., would be of value.)

2. *Concomitant strabismus and the auditory apparatus.*—The writer's studies on premature infants have shown that the auditory appaartus is the first nervous regulator of ocular position. Therefore, it seems reasonable to suppose that defects in the ear (antedating the development of the fusion sense) would favor the development of strabismus, thereby preventing or impeding the development of the normal fusion sense. In view, however, of the predominating influence of the fusion sense, he believes the most favorable conditions for the development of squint exist when defective auditory structure is associated with defective fusion sense.

The examination of thirty children with concomitant convergent strabismus revealed disturbance of rotation-nystagmus in fifteen. Though more cases should be studied before definite conclusions can be drawn, these results at least are suggestive. The important part which heredity plays in strabismus suggests an early examination (before the development of the fusion sense) of the offspring of squinting parents for defects in the auditory apparatus. A. C. S.

Intraorbital Hemorrhage in Intermittent Exophthalmos.

RICHTER, Hamm (*Muench. med. Woch.*, December 27, 1910), reports a case of acute, unilateral exophthalmos in a 20-year-old myopic girl. Some time previously he had noted an intermittent one-sided exophthalmos, and on one occasion the patient claims there had been a more decided proptosis associated with ecchymosis of the lids. The attack which the writer observed was characterized by considerable exophthalmos, ecchymosis of the lids and conjunctiva, intense headache, nausea, syncopal seizures and slow pulse (disturbance of the sympathetic nervous system). Two weeks later the general symptoms had disappeared and the eye was in the original position. He ascribes the orbital disturbance to rupture of a varicose vein within the orbit. A. C. S.

A Case of Luxation of the Lacrimal Gland.

OLOFF, HANS, Kiel (*Klin. Monatsbl. fuer Augenheilkunde*, October, 1910). Oloff reports a case of prolapse of the lacrimal gland through a laceration of the upper lid occurring in a twenty-year-old seaman. The gland was replaced and the laceration stitched with good result. F. K.

Clinical and Experimental Studies of the Morax-Axenfeld Diplobacillus.

Reis, Lemberg (*Klin. Monatsbl. f. Augenheilkunde*, October, 1910), examined 300 clinical cases of conjunctival inflammation bacteriologically, concluding as follows: The diplobacilus catarrh forms nearly half of the cases of chronic catarrhal conjunctivitis. This form of infection assumes usually the form of an angular catarrh, which the author believes to be characteristic of diplobacillus infection. Therefore, the diagnosis of the pure infection is easy, the mixed infection presenting much more difficulty in at least one-half of the cases.

Diplobacillus catarrh is frequently seen in the cicatricial stage of trachoma, but very seldom in acute catarrh or in phlyctenular disease. An examination of the nasal secretion in 37 cases of diplobacillus conjunctivitis showed their existence in 12 cases, whereas in 28 cases of chronic catarrh of the lids showing no diplobacilli, the latter were found in 3 instances in the nasal mucous membrane. Other bacteria found in the nasal mucous membrane were staphylococci, xerosis bacilli, pneumococci, pneumobacilli and spirilli. As there were no symptoms of inflammation of the nasal mucous membrane, these microorganisms had no specific pathogenic action in the nose. F. K.

Conjunctival Suppurations in the Newborn.

William, R. V., and Schwerin, I. M. (*Klin. Monatsbl. f Augenheilkunde*, October, 1910). William speaks especially of the prophylaxis of ophthalmia neonatorum. After a personal investigation and a study of the literature he concludes that a one per cent solution of nitrate of silver is equally efficient as the two per cent of Crede's method and causes less irritation. He thinks that a weaker solution of ½ to ¾ per cent might be efficient and that the use of the 2 per cent solution is no longer justifiable. He considers the use of 5 per cent solution of sophol, an organic silver, as the most convenient efficient prophylactic. F. K.

Contribution to Our Knowledge Regarding Trachoma Bodies and Their Occurrence.

Zade, M., Jena (*Archiv. fuer Ophthal.*, Vol. 77, Part 1), sums up the results of his investigations as follows:

1. In 25 cases of marked granular trachoma from which

smears were made, typical chlamydozoa were found in 10 cases. In five the findings were doubtful and in ten negative.

2. The rapid disappearance of trachoma bodies following treatment mentioned by previous writers, is in accord with the author's findings. The bodies were found with difficulty in recurrent inflammations, even though clinically they resembled acute infections.

3. No positive results were obtained in sections.

4. The trachoma bodies were found only in trachoma.

A. C. S.

Concerning a Peculiar Until Now Unknown Opacity of the Cornea. (A Contribution to Our Knowledge Regarding the Normal Structure of the Cornea?).

Fleischer, Tubingen (*Archiv. fuer Ophthal.*, Vol. 77, Part 1), describes a peculiar opacity of both corneæ in a case of multiple sclerosis. Anisometropia, hyperopic oblique astigmatism and marked corneal curvature pointed to congenital ocular malformation.

Oblique illumination revealed a delicate haze of both corneæ which with the loupe was found to be situated in a superficial concentric plane of the cornea. The opacity spread out over almost the entire cornea and was quite delicate, vision being but slightly impaired.

More detailed examination showed the opacity to be composed of radiating whirl-like striations or bundles converging towards a point slightly below the center of the cornea, a horizontal clear line separating the upper from the lower half. The specks composing the opacity were of a yellowish red-brown color. The surface of the corneæ was reflecting and the eyes quiet. Examination one and one-half years later revealed no changes.

Fleischer believes the opacity perhaps expresses the anatomic arrangement of the tissue elements in a superficial lamella of the cornea—perhaps at the posterior surface of Bowman's membrane. The embryologic explanation of this may be that after closure of the lens vesicle the elements of the mesoderm grow from the margins of the optic vesicle towards the former point of constriction, where they meet, and, assuming greater growth tendency from above and below, the formation of a horizontal line of junction becomes conceivable.

A. C. S.

Experimental Studies Regarding the Trachoma Question.

FRITSCH, HOFSTAETTER, LINDNER, Vienna (*Archiv. fuer Ophthal.*, Vol. 76, Part 3), conclude that both in the male and female genital tract there may occur a nongonorrheal inflammation transferable to the newborn during birth. The morphologic findings, the positively resulting inoculations in monkeys, and the successful transplantation to the human subject, proves the inflammation to be trachomatous. A. C. S.

New Formations at the Corneal Limbus.

HEILBRUN, Halle (*Archiv. fuer Ophthal.*, Vol. 77, Part 3), examined four tumors of the limbus histologically:

1. An anatomically benign, tumor-like, recurring hyperplasia of the epithelium.
2. A papilloma with extension to the cornea.

3 and 4. Two carcinomata.

From a study of these cases he divides the epithelial proliferations at the limbus into:

1. Benign, tumor-like, recurring hyperplasias of the epithelium.
2. Epithelial hyperplasias in which the connective tissue base also is thickened with a suggestion here and there of papillary formation (prepapillomatous type).
3. Typical papillomata.
4. Primary carcinomata.

One of the cases of carcinomata described by the writer occurred in a twenty-year-old boy, who claimed that after a lime injury fifteen years previously, a reddish nodule formed on the bulbar conjunctiva which subsequently slowly increased in size. Vision, 5/5. The tumor was excised and the base cauterized. A. C. S.

On Sarcoma of the Chorioid and Necrosis of the Uvea.

FUCHS, E., Vienna (*Archiv. fuer Ophthal.*, Vol. 77, Part 2), presents his views, the result of a study of 150 cases of sarcoma of the chorioid, under the following headings:

1. Structure of the sarcomatous tissue.
2. Pigment.
3. Free pigment cells.
4. Necrosis.

While the first three chapters confine themselves to pathologic questions, chapter 4, an abstract of which follows, deals with practical facts of clinical importance.

Necrosis is a frequent complication of many tumor formations. Necrosis of intraocular sarcomata interests the ophthalmologist because it alters the clinical course of the disease, converting the usual glaucomatous appearances into a severe iridocyclitis with subsequent atrophy.

In 150 of the author's cases, 62 showed necrosis. In ten there was almost complete necrosis of the tumor; in two the whole tumor was necrotic, the only living sarcomatous tissue being found in episcleral nodes. In seven no living cells were found. Since a complete serial study, however, was not made in these cases, the possibility of the occurrence of complete necrosis is still open to question. A priori, however, Fuchs believes in such a possibility and, therefore, in a spontaneous cure, necrosis leading to inflammation followed by atrophy of the globe.

Excepting that very small sarcomata escape necrosis and fungiform varieties are perhaps more liable to necrosis than flat sessile growths, he is unable to assert that certain varieties of sarcoma predispose to necrosis.

In most cases the necrosis is probably due to disturbance of nutrition, the first signs of necrosis usually appearing in the regions farthest removed from blood vessels. First of all, there results an asphyxia of the cells because of insufficient carbon dioxid, the subsequent death and disintegration of the cells liberating a toxin, which accounts for the extension of necrosis. He is unable to give an explanation for "necrosis en bloc."

As a rule, only when the necrosis suddenly involves the whole tumor, do severe inflammatory symptoms follow, characterized histologically by disappearance of the cell boundaries and nuclei, hemorrhagic and inflammatory reaction in the adjoining tissues. In the chronic cases there is usually a mottled pigmentation, consisting of dark brown rings or half rings. Former necrotic areas appear as pigmented indurated tissue.

The severity of necrosis and inflammation of the internal ocular membranes is directly proportionate to the extent and suddenness of onset of the tumor necrosis. It is dependent also upon the position of the necrotic focus (superficial or deep), the condition of the surface of the tumor (exposed, protected by normal tissue layers or new formed membrane) and the position of the new growth in the subretinal or vitreous space. The toxins act either on the adjoining portion of the sclera or upon the whole internal surface of the eye in cases where the diffusion of toxins into the eye is possible. Inflammation of the sclera leads to edema and swelling and sometimes to liquefaction, abscess formation and hernia. This posterior inflammation may result in proptosis, thus simulating extraocular proliferations.

In very extensive or total tumor necrosis, in addition to the localized scleritis, there is always involvement of all the internal ocular coats, resulting in violent inflammatory symptoms and immediate total loss of vision. There occurs edema of the lids, conjunctival chemosis and proptosis. The cornea is hazy and occasionally presents disk or ring shaped opacities. The aqueous is cloudy or blood tinged, or the whole chamber is filled with blood. The anterior chamber is generally shallow or obliterated, the pupil wide, and though the discolored iris is adherent to the lens capsule no synechiæ are visible in the pupillary space. The lens is often opaque or may be luxated. In eyes with sufficiently transparent media, a gray or brown reflex is seen in the interior of the eye. The tension is always much increased.

The necrosis of the internal ocular membranes is followed, in the course of several days, by a severe plastic inflammation in the interior of the eye, and the more complete this necrosis the later probably the onset of plastic inflammation, the suspension of circulation preventing migration from the vessels of the necrotic tissue.

The acute external manifestations correspond with the beginning of necrosis. While necrosis may affect all membranes, the intensity of the process in general diminishes with the distance from the tumor, and usually is more pronounced in the anterior portion of the eye, leaving out of consideration the location of the tumor itself.

A partial necrosis of the cornea occurred in four cases, the condition being characterized by necrosis of the endothelial membrane and corneal corpuscles without alterations in the corneal lamellæ. Though extending far into the periphery, the necrosis did not involve the anterior layers of the cornea. Three cases showed a ring infiltrate, one of which terminated in a ring abscess. Necrosis of the iris was always associated.

Necrosis of the iris may be either partial or complete. In partial necrosis only a portion of the iris in its entire thickness or certain layers are affected (retinal pigment layer, posterior layers of iris stroma), the layers first subjected to the influence of the toxin. In these cases the anterior layers are but little affected; only in one case, in which a layer of exudate covered the posterior surface, were the anterior layers necrotic and the posterior layers intact.

The chromatophores undergo various degenerative changes, and the retinal pigment layer after solution of the intercellular cement breaks up into its cell components, which is followed by the death of the cells, or they may become migratory, being subsequently found in retro-iritic exudate, in the iris, and in one case with a corneoscleral cicatrix, even under the conjunctiva. The nuclei of the vessel cells, especially of the endothelium, are most resistant to the toxin.

While the necrosis of the iris following infectious inflammations is similar to that caused by a necrotic tumor, in necrosis succeeding circulatory disturbances (iridodialysis, glaucoma) a gradual death of the tissue occurs unassociated with signs of severe inflammatory reaction.

Clinically necrosis of the iris due to chorioidal sarcoma is characterized by a narrowing and thinning of the iris, absence of relief and of normal pigmentation.

Necrosis affects the ciliary body earlier and more severely than the iris, the pathologic changes being similar to those observed in the iris. The destruction of the epithelium layer effects a closer union of plastic exudate with the stroma tissue than in ordinary iridocyclitis where the pigment layer remains intact.

The chorioid least often becomes necrotic; inflammation not only follows necrosis more quickly, but frequently occurs in place of necrosis.

The whole retina becomes necrotic very early. A. C. S.

Concerning the Nature of the Convulsions in Zonular Cataract.

Frank, E., Heidelberg (*Archiv. fuer Ophthal.*, Vol. 77, Part 1), contributes the following data from a study of 36 cases of zonular cataract:

A history of spasms was obtainable in 16 cases; these were principally tonic in character (in five, purely tonic), true clonic spasms having occurred in only two cases. In six no exact distinction was made. Tetany was present in one case, an eighteen-year-old girl, the nervous symptoms dating back one year. Since poor vision preceded these symptoms, however, no etiologic significance can be ascribed to the disease. Moreover, in this case rachitis, too, was present.

Frank believes rachitis the prime etiologic factor (Horner's theory). In 24 cases (68.5%) the disease was demonstrable: in 15 (42.8%), of which convulsions also had been present. In the majority the rachitic manifestations were not severe. The dental lesions predominated, being present in 20 cases. In 18 cases general rachitis and in 4 cases skull malformations were present. The dental signs in general conformed to Horner's description; especially striking was the small size of the incisors and canines and the imperfect development of the enamel.

Zonular cataract, therefore, does not seem to owe its origin to severe rachitic disease; certain forms, in particular the dental type, seem to predispose.

These statistical results agree closely with those of Horner, v. Arx and Baehr. The high percentage of cases in which rachitis is found a complicating condition rather disproves Peters' theory attributing the affection to tetany. His conclusions were based principally upon the examination of 80 marked cases of rachitis, not a single case of zonular cataract being found; whereas in 10 cases of tetany the condition was found four times. Since Peters examined one eye only of each patient, however, his deductions are open to question.

While the disease has been known to originate before birth, Frank considers most of his cases of extrauterine origin, with rachitis as the causative agent. In two cases in which rachitis was not present (two daughters of a consanguineous parentage) abnormal fetal conditions probably predisposed.

Though about ten cases of tetany annually come under observation at the pediatric clinic in Heidelberg, the writer's statistics include only one case of tetany in association with zonular cataract, allusion to which has already been made. The late occurrence of the disease in this case, however, excludes it from the infantile class of cases. A distinction should be made between tetany of infancy and tetany of the adult; in the latter, cataract and vasomotor trophic disturbances not infrequently occur. A. C. S.

A Remarkable Discovery in an Abscess of the Vitreous.

Purtscher, A., Vienna (*Archiv. fuer Ophthal.*, Vol. 77, Part 1). The abscess was encapsulated and associated with a perforating corneal cicatrix, anterior synechiæ and traumatic cataract. In the abscess were found druse-like formations (resembling bundles of minute needles) surrounded by concentrically arranged cell clusters in which the polymorphonuclear leucocytes predominated. He believes these formations probably products of bacterial or fungous disintegration. A. C. S.

On the Central Canal of the Vitreous.

Bribach, E., St. Louis, Strassburg (*Archiv. fuer Ophthal.*, Vol. 76, Part 1). Wolfrum does not believe the hyaloid canal to be a constant finding in the fully developed eye, and that when found is generally the result of stretching and disarrangement of the axial vitreous fibers (with the formation of hollow spaces), which occurs during the removal of the ocular coats.

Bribach's studies, based on the examination of 250 pigs, cows and sheep's eyes and 8 human eyes, by a method excluding the possibility of a mechanically produced hyaloid canal, prove the existence of this canal in the majority of cases, which is in accord with the findings of Stilling and Schaaf. A. C. S.

Contributions to Our Knowledge Regarding the Genesis of Choked Disk.

Schieck, F., Goettingen (*Archiv. fuer Ophthal.*, Vol. 78, Part 1). This article submits further evidence in favor of the author's theory, published in 1910, attributing the intraocular process solely to mechanical causes—to the action of increased intracranial pressure upon the intervaginal space of the optic nerve causing the cerebrospinal fluid to be driven into the perivascular lymph spaces of the central vessels and thence to the hilus of the papilla, the pathologic increase of pressure within these lymph sheaths overcoming the backward pressure of lymph from the posterior portion of the globe.

The evidence is based upon clinical observations, pathologic investigations, experiments on cadaver eyes and on animals.

A. Clinical Observations.—Observations were made in 7 incipient cases of choked disk (4 transitory and 3 progressive cases), a study of the eyegrounds of these patients furnishing data in harmony with Schieck's theory. Thus the first changes noted consist in a veiled appearance of the disk where the large vessels emerge from the lamina. A second vessel reflex anterior to the normal reflex is observed, this reflex corresponding to the detached lamina interna. Exudate then collects about the vessels and may project into the vitreous as a cloud. Simultaneously there occurs dilatation of the perivascular lymph sheaths followed by a delicate striation of the disk and adjacent retina associated with slight, subsequently increasing indistinctness of the disk margin where the vessels cross over. Continuation of the process results in veiling of the nervehead at the upper and lower poles, corresponding to the usual course taken by the large vessels, the portions of the disk not crossed by vessels remaining clear the longest. A papilla with completely obscured margins, therefore, is indicative of an older process than one partially swollen, but with clean cut temporal and nasal borders. The degree of venous congestion and arterial constriction is probably dependent upon accidental circumstances. Hemorrhage may occur at any time; fatty changes, however, belong to the later stages. During regression the symptoms disappear in the reverse order, fluid exudate remaining visible longest in the physiologic excavation.

B. Pathologic-Anatomic Investigations.—The author reports the findings in 4 cases (8 eyes), three of which showed acute choked disk. The eyes were hardened in Orth's and Mueller's fluid. He found a fluid transudation of the papilla without signs of inflammation. He was unable to find an edema involving the entire axial bundle (probably because of the early stage); in every case, however, a dilatation was observed in three places—at the junction of the axial sheaths with the intervaginal space, immediately in front of the lamina, and within the papilla, the distension of the perivascular lymph sheaths in these parts suggesting a distal fluid movement.

C. Experiments with Cadaver Eyes.—Results were obtained confirming the author's hypothesis. The experiments showed that fluid under pressure is forced into the centrifugal channel (the axial sheath), and that an escape through the dura alongside the central vessels does not occur.

D. Experiments on Animals.—These showed that increase of intracranial pressure alone is not sufficient to produce choked disk, but that simultaneously an increase in the quantity of intracranial fluid is necessary. (In one monkey an enormous rise of tension followed the subcranial introduction of 10 grams of paraffin without resulting in ophthalmoscopic or histologic changes, whereas in another animal small quantities of saline introduced under pressure caused a pronounced swelling of the nervehead on the operated side.)

He believes that while increased fluid secretion may be due to meningeal irritation or inflammation, the fluid itself does not cause inflammation.

He concludes that choked disk is the ophthalmoscopic expression of increase in quantity and pressure of the cerebrospinal fluid in the intervaginal space of the optic nerve, which results from intracranial or orbital processes, the ocular manifestations being brought about by the forced penetration of fluid from the intervaginal space to the preformed lymph sheaths of the axial bundle and thence to the nervehead.

That choked disk probably occurs sooner on the side of greater fluid accumulation, in many cases this being the side of the tumor formation.

That the position of the fluid accumulation is not always identical with the position of the tumor.

That in the performance of palliative trephining the side exhibiting the greater nerve swelling should be selected for operation as the more probable side of greater fluid accumulation. If definite nervous symptoms, however, localize the tumor in a certain region of the brain and extirpation is contemplated, the degree of nerve swelling should receive second consideration. A. C. S.

Concerning a Few Cases of Optic Nerve Disease and the Islands in the Visual Field in This Affection.

Kooy and de Kleijn, Utrecht (*Archiv. fuer Ophthal.*, Vol. 77, Part 3). While most fields illustrative of disease of the optic nerve are represented as continuous, the writers believe that in many such cases a careful examination with the campimeter will reveal islands of functionating retinal regions. These may be responsible for the slight annoyance often experienced by patients with strongly contracted visual fields.

The writers made examinations in 11 cases of optic nerve disease—one case each of hemianopsia, central disease, one following measles, brain tumor, multiple sclerosis, tabes and intestinal hemorrhage; two cases each of disease of the optic nerve of rhinologic origin and of optic atrophy following choked disk. In every case excepting two (hemianopsia, atrophy after choked disk), these islands were found.

A. C. S.

Pathologic-Anatomic Investigations Regarding Alcohol Amblyopia.

Roenne, H., Copenhagen (*Archiv. fuer Ophthal.*, Vol. 77, Part 1), concludes with the following resumé:

1. The anatomic examination of the visual tracts in 38 marked cases of alcoholism disclosed in 11 cases a degeneration of the papillo-macular bundle.

2. He always found in toxic amblyopia, in the retina, a degeneration of the ganglion cell layer entirely proportionate to the extent and intensity of the central color scotoma.

3. The examination of serial sections of six chiasms showed the course of the fibers to be as follows: The uncrossed bundle is situated centrally in the optic nerve and in each half of the chiasm. In the nerve the crossed bundle, too, occupies a central position; in the intracranial portion, however, it begins to assume a more dorsal position and then lies adjacent to the ventrolateral border of the large dorsal pial septum. In the chiasm it lies completely dorsal, decussating in the dorsal portion of the middle and posterior third of the chiasm, and eventually it joins the uncrossed bundle in the tract, where it lies dorsally to the latter.

4. His findings regarding the position of the bundle in the tract agree in every way with those of Widmark.

5. In the external geniculate body, a cell degeneration was

manifest, indicative of macular projection from the ganglion. The degeneration confined itself to the small cells of the posterior half of the ganglion, the lateral "horns," however, escaping. The large ganglion cells were never disturbed.

6. In the occipital neuron no degeneration was revealed which could be considered as related to toxic amblyopia.

7. The appearance of the degeneration did not warrant the supposition of an interstitial neuritis. The apparently circumscribed, very marked degeneration just behind the globe and in the optic canal did not result from previous inflammatory processes, but represented a different degenerative process than in other parts of the nerve owing to special anatomic conditions. This view is supported by a case in which a papillo-macular degeneration was found in one nerve, while in the other an ascending degeneration secondary to an old retinal detachment was present, the secondary interstitial changes in each nerve being the same.

8. The examination of a case in which Weigert's glia stain proved successful confirmed Birch-Hirschfeld's views on the relations of the glia tissue in degeneration of the most anterior portion of the nerve. In the most posterior portion of the nerve as well as in the tract (of which no examination had ever been made) he found a marked new formation of the longitudinally coursing glia fibers identical with Spielmeyer's findings in tabetic optic nerve atrophy.

9. In the retina he found a degeneration of the small ganglion cells which are characteristic of the paracentral region, whereas the number of large ganglion cells, found both centrally and peripherally, was not diminished. This (in conjunction with other circumstances) suggests that toxic amblyopia should perhaps be considered a ganglion cell degeneration with secondary fiber degeneration. Such an elective degeneration of particular central cell structures with preservation of other central elements may be satisfactorily explained by the clinical peculiarities of the affection.

A. C. S.

The Relation of Diseased Retinal Vessels to Those of the Brain.

Geis, Franz, Dresden (*Klin. Monatsbl. fuer Augenheilkunde,* January, 1911). In a study based upon 250 observations of diseased retinal vessels, including pathologic microscopic examinations, Geis arrives at the following conclusions regarding their prognostic influence upon disease of the brain:

1. Sclerotic retinal vessels evidenced by sharp bendings or depressions, thickening of the arterial walls, sometimes advancing to complete obliteration associated with hemorrhages and plaques, are evidences of cerebral vessel change and may be considered as early signs of apoplexy.

2. Sudden occlusion of the central artery of the retina or its branches can be considered as being due to arteriosclerosis of the retinal arteries in all cases occurring in patients over 40 years of age in whom no other etiologic factor, especially cardiac disease, can be found. The prognosis in these cases is the same as in cases of visible arterial change, except that the cerebral palsy may be delayed.

3. In occlusion of the vessels up to the thirty-ninth year and in persons over 40 years in whom there is a cardial disease, no definite prognosis regarding brain lesions is possible.

4. Syphilitic changes of the retinal vessels are rather infrequent and have not the prognostic influence of arteriosclerosis.

5. Thrombosis of the vein is followed in 40 to 50 per cent of cases by arteriosclerosis of the cerebral vessels, which latter may cause palsy after several years. In the other 50 per cent of cases, it remains a local disease. If there are additional signs of general arteriosclerosis, including albumen in the urine, no absolute prognosis can be given, because in 80 per cent of these cases apoplexy takes place some years later, and 20 per cent remain well. If, however, the retinal arteries show arteriosclerotic change, the prognosis of impending change in the cerebral vessels is positive.

6. Sclerosis of the chorioidal vessels has no prognostic value regarding cerebral lesions.

7. Retinal hemorrhage in arteriosclerosis, diabetes and chronic nephritis are frequent precursors of cerebral hemorrhage and softening.

8. A similar prognostic value may be assumed in cases of retinal hemorrhage in which all factors may be excluded except general arteriosclerosis, with the exception of cases of recurrent vitreous and retinal hemorrhages in the young.

9. Isolated macular hemorrhage and preretinal hemorrhages have no strong prognostic importance.

10. Retinal hemorrhage in syphilis has no prognostic importance.

11. Increase of blood pressure in cases of retinal hemorrhages is of serious importance regarding brain lesions.

12. The most serious prognosis regarding life is retinitis albuminurica (with exception of Ret. alb. Gravidar). The former is, as a rule, a precursor of death. In one-third to one-fourth of cases, cerebral hemorrhages take place.

13. Retinitis diabetica has a simular prognostic value, except that it is not so fatal, 50 per cent dying, however, in two to three years.

14. Vitreous hemorrhages have no definite prognostic value.

15. Subconjunctival hemorrhages may occur in normal individuals and has no significance unless associated with disease of the retinal arteries. F. K.

Investigations Concerning the Etiology and Pathologic Anatomy of Creeping Traumatic Intraocular Inflammation and the Pathogenesis of Sympathetic Ophthalmia.

Gilbert, W., Munchen (*Archiv. fuer Ophthal.*, Vol. 77, Part 2), concludes as the result of his experimental investigations that:

1. After severe aseptic injuries of the anterior ocular segment a marked papillitis occurs, due probably to the migration of inflammatory products through the vitreous to the papilla. Less intense degrees of papillitis also occur in septic inflammations.

2. The purulent envelop surrounding a steel particle in the vitreous is at first composed of leucocytes which gradually are replaced by lymphocytes.

3. In traumatic serous iritis there may occur considerable plastic exudation or a chorioidal infiltration resembling the variety observed in septic endophthalmitis.

4. The post-traumatic intraocular inflammations induced by various kinds of cocci are characterized by a deposition of pus cells upon the inner surface of the ocular membranes, in the vitreous and portions of the retina, and by a less pronounced infiltration of the chorioid resembling the variety

described by Fuchs in septic endophthalmitis. The chorioidal infiltration consists chiefly of round cells; leucocytes are few in number and eosinophiles very rarely observed.

5. In markedly chronic inflammation, eosinophiles in the uveal tract are the more numerous the less pronounced the surface exudation or the condition septic endophthalmitis in which the neutrophiles predominate in the vitreous. Neutrophiles are representative of a purulent, eosinophiles of a chronic inflammation.

6. Eosinophiles in the eye may follow blood disintegration; these, however, exhibit a more irregular granulation than the usual forms. Plasma cells occur in chronic uveitis of diverse etiology.

7. The character of the exudate cells in post-traumatic intraocular inflammation is dependent principally upon the degree of inflammation, not on the nature of the inflammatory excitant.

8. Not all xerosis bacilli found in the vitreous should be considered saprophytes. In the etiology of traumatic uveitis saprophytes have no important significance.

9. In perforating injuries it is frequently impossible, during the first few days, to determine whether an eye is infected, and sometimes it is never possible to determine this clinically.

10. Every perforating ocular injury with obscure etiology calls for X-ray examination.

11. In creeping traumatic inflammations and in sympathetic ophthalmia an increase of lymphocytes at the expense of neutrophiles is frequently observed in the blood.

Sympathetic Ophthalmia. 1. The mononuclear round cell is the only cell variety invariably present in sympathetic uveitis; next in order of frequency are the epithelioid cells and eosinophiles. Giant cells and particularly plasm cells are frequently absent.

2. Sympathetic uveitis is characterized either by a typical sympathetic infiltration or by a fibrinoplastic exudation; sometimes transitional types occur. It is, therefore, impossible to make a diagnosis of sympathetic inflammation alone from the histologic appearances. In questionable borderline cases the clinical history must decide the question.

3. The transference of sympathetic ophthalmia by venous an-

astomoses may be effected by the veins over the bridge of the nose, those of the septum, the terminal branches of the ethmoidal veins and by the circular sinus.

4. Catarrhal conditions of the nasal mucosa, fugacious injection of the sympathizing eye, headache before and during the outbreak of sympathetic ophthalmia can only be satisfactorily explained by the assumption of a congestion of the orbital and interorbital circulation favoring the probability of transference by venous channels. A. C. S.

On Endogenous Gonorrheal Affections of the Cornea and Skin.

Heerfordt, Copenhagen (*Archiv. fuer Ophthal.*, Vol. 77, Part 1), presents the clinical histories of ten cases of keratitis complicating gonorrheal urethritis; general gonorrheal disturbances (arthritis) were present in nine. The corneal lesions occurred as complications of an endogenous gonorrheal epibulbar subconjunctivitis, an affection described by the writer in *Graefe's Archives*, 1909, Vol. 72, Part 2.

As in endogenous gonorrheal conjunctivitis the corneal inflammation exhibited the same changeable, benign characteristics, each attack likewise consisting of a series of smaller seizures, the affection subsiding with the recovery from the urethritis. The inflammation resembled phlyctenular, herpetic or parenchymatous forms of keratitis, sometimes all these varieties appearing in the same patient.

A study of one case in particular convinced him that this form of keratitis, too, must originate endogenously—from the inflamed subconjunctiva—the process in the cornea probably consisting in a posterior-anterior penetration of fluid exudate along the nerve fibres.

While it has been shown that virulent gonococci may be the causative agents, the writer is more inclined to ascribe the ocular complications in general to bacterial particles or toxins. That these substances do not always reach the subconjunctiva by the blood stream is indicated by the fact that no case of iritis with synechiae was ever observed by the writer in connection with subconjunctivitis, though both episclera and iris are supplied by the same arterioles. The toxins are probably usually conveyed to the subconjunctiva by nerve or lymph channels.

The Resemblance of Endogenous Gonorrheal Keratoconjunctivitis to Endogenous Gonorrheal Dermatitis. Both affections are probably usually caused by dead cocci or toxins. The inflammation in both is external; either entirely superficial (in the corium or conjunctival mucosa) or somewhat deeper (in the subcutaneous tissue or subconjunctival episcleral tissue).

The dermatitis is characterized by the formation of subepidermal vesicles or herpetic groups of vesicles. Sometimes the cutaneous manifestations assume a hemorrhagic character resembling some cases of gonorrheal subconjunctivitis.

In both affections the pathological changes are probably brought about by the conveyance of fluid toxins along nerve fibres. In both the attack is made up of several smaller seizures. In both the prognosis is favorable. A. C. S.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

CLARENCE LOEB, M. D.,

ST. LOUIS,

AND

M. W. FREDERICK, M. D.,

SAN FRANCISCO.

Marginal Degeneration of the Cornea.

DUYSE, VAN, Ghent (Dégénérescence marginale des cornées, *Archives d'Ophtalmologie*, 1910, Vol. XXX, p. 657), has observed a case for twenty-five years. When first seen, there was a groove on the upper corneal margin resembling an ulcer in the process of repair. Seen fifteen years later it occupied the position of an arcus senilis, and was now present on both eyes. Five years later there was an ectatic deformity of the originally affected eye, while the second eye had developed a groove similar to that previously observed in the right. At the present time, the right has the appearance of a buphthalmic eye. There is a cataract. Anteriorly, an irregular ring 3 mm. in size, of a purple color, encloses the corneal border. The groove occupies almost the entire corneal margin. The upper part is ectatic, more or less transparent and greyish and is traversed by fine blood vessels arising in the conjunctiva. A nasal segment of the cornea is limited above by the white border of the superior groove. On the temporal side it is limited by a white border analogous to the other, which it cuts at the inner third. Below it is limited by a circular transparent area, almost 2 mm. in diameter. Outward, by the corneal border. This portion outlined is occupied by an oval transparent area.

On the temporal side there is another white border with a nasal concavity, dividing that side from the central part of the cornea.

The changes on the other eyes are less pronounced, conforming more to the typical picture of the lesion. C. L.

The Striae on Descemet's Membrane in Hydrophthalmos.

Landolt, M. (Les vergetures de la membrane de Descemet dans l'hydrophthalmie, *Archives d'Ophtalmologie*, 1910, Vol. XXX, p. 666), reports several cases of hydrophthalmos where he had studied the condition of Descemet's membrane. He found that the point of rupture was very variable. In most eyes, the membrane was thicker than normal; it is made more manifest by the general thinness of the rest of the corneal tissue. It is due to a doubling of the membrane in most cases, especially close to the point of rupture, but it is also found far from the rupture as a true thickening. At the site of the rupture, the corneal tissue loses its proper character and degenerates, probably under the influence of the aqueous. Sometimes, the two ends of the membrane seem to be united by a kind of connective tissue resembling corneal tissue. This is, however, in reality only true corneal tissue projecting at the niveau of the rupture. When the membrane ruptures, the ends curl forwards, sometimes doubling on themselves several times. Following this, there is a proliferation of endothelium from all sides to cover the denuded surface. It then, so to speak, commences to secrete a new membrane with a lamellar structure. In the course of time, the new membrane becomes more homogeneous and resembles more the old membrane; even the fine line of demarcation and the difference in staining disappear. C. L.

Scarlet-Red in Ophthalmology.

Dauthuile, A., Lille (Le Scharlach-Roth en Ophtalmologie, *Le Nord-Médical*, 1910, Vol. XVII, p. 261), reports three cases, one of ulcer and two of burns, which were treated with scarlet-red. He finds that the conjunctiva tolerates well a 5% ointment, which has no antiseptic power, however. It is very valuable in wounds and atonic ulcers of the cornea. He has also found it very valuable in trachomatous ulcers. C. L.

Remarks on the Operation for Cataract in the First Half of the Nineteenth Century, Etc.

Terson, A. (Remarques sur l'opération de la cataracte dans la première moitié du xixe siècle, a propos d'un tab'eau historique, *Archives d'Ophtalmologie,* 1910, Vol. XXX, p. 685), writes of a painting in the Carnavalet Gallery at Paris which shows a cataract operation by Dupuytren, in 1825. The operation was probably a reclination, which, as the literature shows, was still practiced extensively at that time.

C. L.

Nystagmography.

Coppez, H., Brussels (La Nystagmographie, *Archives d'Ophtalmologie,* 1910, Vol. XXX, p. 693), has studied the tracing made by a nystagmic eye, where the nystagmus is due to rotation, galvanic, thermic or pneumatic irritation, and finds that they differ widely from each other and from those obtained in spontaneous and in congenital nystagmus. C. L.

The Introductory Lecture of Professor Felix Lagrange.

Lagrange (Lecon d'ouverture du professeur Félix Lagrange, *Archives d'Ophtalmologie,* 1910, Vol. XXX, p. 721), in assuming the chair of clinical ophthalmology in the University of Bordeaux, praises Prof. Badal and mentions a number of papers which he has contributed to ophthalmic literature. He compares the hospital at Bordeaux with those of other cities, e. g., Budapest, and deplores the insufficient equipment of the former. For the performance of proper scientific work, a professor should have at his command (1) a well equipped clinic, (2) a laboratory of pathologic anatomy and bacteriology, (3) an experimental laboratory. It is from the intimate relation between the laboratory and the clinic that progress in ophthalmology may be expected. There are a number of problems caused by surgical interferences upon the eye, whose solution can be determined only after experimental research; e. g., What is the cause of the subacute iritis which sometimes follows a cataract operation? Or what is the pathologic anatomy of the filtrating cicatrix, that is, how does it act? Or what is the value of orbital implantation of living tissue? These and many other questions are suggested as suitable ones for investigation via clinical and experimental research. Two conditions are necessary for progress, (1) an open mind, and (2) an equipment suitable for experimental verification of the truth of the new idea.

There are two varieties of ophthalmology, (1) that of the specialist, and (2) that of the general practitioner. The latter should be taught to students. Papers should concern themselves with the former. The student should be taught to examine the cases both externally and ophthalmoscopically. They should know how to diagnose a purulent ophthalmia, a syphilitic iritis, a phlegmon of the lacrimal sac, etc. However, they should also know how to estimate errors of refraction, and to examine the media for lesions of their transparency.

The lecture is one that could be read in toto with profit by student and teacher, specialist and general practitioner.

C. L.

Investigations Upon the Retinal Adaptation of Miners and Nystagmus.

Weekers, L., Liege (Recherches sur l'adaptation retinienne des houilleurs et des nystagmiques, *Archives d'Ophtalmologie*, 1910, Vol. XXX, p. 742), emphasizes a symptom of occupation nystagmus which has received little attention, viz., the lack of adaptation to feeble illumination. Using the adaptometer of Nagel, he made a series of investigations as follows:

1. The retinal luminous sensibility and adaptation of normal eyes.
2. The function of adaptation in miners.
3. Adaptation in nystagmic miners.

(1) In young people the adaptation is rapid and ample, but undergoes a moderation and diminution in older people. Binocular luminous sensibility is always superior to monocular adaptation, while that of one eye may be superior to that of the other.

(2) The power of adaptation in miners with normal eyes is far superior to that of people with other occupations. Miners with only one eye fall short of the professional capacity of those with two normal eyes. For a long time after the accident through which they lost the eye, these miners have an adaptation less than normal.

(3) The alteration in the retinal adaptation in nystagmic miners fall into two classes. In the first, the curve of adap-

tation rises with a distinct delay, but nevertheless attains the normal level. In the second, the degree of adaptation is distinctly less than normal. However, there are transitional forms between these two distinct types. The first class on passing from a normal to lessened illumination complains of considerable uneasiness of the eyes. There may or may not be a relation between the nystagmus and the change in retinal adaptation, but those patients who complain of most trouble with their work always have the most marked changes in adaptation. C. L.

A Case of Conjunctivitis Petrificans.

Peretz, H., Cairo (Sur un cas de conjunctivite pétrifiante, *Revue Générale d'Ophtalmologie*, 1910, Vol. XXIX, p. 145), reports a case of this rare condition. In the preceding year, the patient had a severe case of bilateral trachoma which was treated by expression of the granules, combined with excision of the superior cul-de-sac. At that time, there was a thick pannus on the right cornea, which cleared up considerably under treatment. However, the patient left before the cure was complete. When seen by Peretz, both eyes showed a condition of trachoma undergoing cicatrization. In the left superior palpebral conjunctiva, there was a quasi rectangular area about 20 mm. by 4 mm. containing a calcareous deposit. It was white, firm, finely granulated, and not extending above the niveau of the surrounding conjunctiva. The other eye showed only the lesions of old trachoma. The treatment consisted of painting the lesion with a 1 to 40 solution of lithium benzoate. The result was quite good, but as this lesion progressed towards cure, a similar one developed in the other eye, the progress of which the author was able to watch, and later to cure with the same treatment. C. L.

Bilateral Mucocele of the Frontal Sinus.

Truc, H. and Lemoine, P., Montepellier (Mucocele bilatérale du sinus frontal, *Revue Générale d'Ophtalmologie*, 1910, Vol. XXIX, p. 193), report a case of the above which by its size caused exophthalmos, strabismus and diminution of vision of the left eye. The pupil reacted feebly to light and accommodation. The disk was discolored, the arteries were narrow and the veins a little dilated. The field of vision was narrowed, but there was no scotoma. Removal of the cyst in toto being impossible, it was incised and a thick, viscid, greenish-brown fluid evacuated. The orbital wall of the frontal sinus was destroyed and posteriorly the dura mater was free for an area of about the size of a dollar. Internally, the ethmoid labyrinth was opened by the destructive process. The result of the operation, as far as the eye was concerned, was a diminution of the exophthalmos, but no change in the immobility of the ball or in the vision. The tumor was found to be composed of normal tissue, distorted and displaced by the dislodgment of the cyst. C. L.

A New Giant Magnet for the Extraction of Magnetic Intraocular Bodies.

ROLLET (Un nouvel électro-aimant géant pour l'extraction des corps magnétiques intra-oculaires, *Revue Générale d'Ophtalmologie*, 1910, Vol. XXIX, p. 241) describes a new form of electromagnet for which he claims great mobility and a high degree of magnetic power. It is a vertical magnet, which can be approached very near to the eye by means of the action of a screw. The support is on wheels, so that the whole apparatus can be easily moved. The weight of the magnet is 70 kilograms, and can lift a weight of 350 kilograms. The technic of its use is as follows: The patient is placed in bed and the magnet is suspended over the head of the patient. A corneal section and even an iridectomy is then performed. The point of the magnet is approached to the eye and the current gradually increased. There is an interrupter, which makes the magnet a continuous or an intermittent one.

C. L.

The Etiology of Trachoma.

MEYERHOFF, Cairo (Recherches sur l'étiologie du trachome, *Revue Générale d'Ophtalmologie*, 1910, Vol. XXIX, p. 289), had for six years examined the secretions of about 3,000 cases of conjunctivitis, of which about 600 were non-complicated acute follicular trachoma. They found the chlamydozoa of Prowazek in 60 per cent of recent trachoma, very rarely in old cases and never in the cicatricial stage or in non-trachomatous conditions. These bodies first appear as small points scattered through the protoplasm. They are larger than staphylococci, are polymorphous, piriform or irregular and are sometimes surrounded by a clear aureole. In the second stage, the corpuscles are more distinct and are arranged in a cluster near the nucleus. This cluster becomes larger and larger while the bodies become smaller and smaller. In the third stage, they almost fill the cell, deforming the nucleus somewhat. Around them is sometimes found a haze which colors blue with Giemsa. In the fourth stage, the cell ruptures and the bodies escape. C. L.

Discussion of 2430 Cataract Extractions.

ROLLET, Lyon (Considérations sur 2430 extractions de cataracte, *Revue Générale d'Ophtalmologie*, 1910, Vol. XXIX, p. 337), discusses the statistics of 2430 cases operated on by himself. He found the etiology to be: Senile in 86.6% ; congenital, 2.1% ; hereditary, 0.3% ; diabetic, 1.1% ; albuminuric, 0.3% ; secondary, 0.6% ; adherent, 2.5% ; traumatic, 3.6%; dystropic, 1.9% ; luxation, 0.5%. There was a progressive improvement in vision, probably due to lessening of the post-operative astigmatism. C. L.

Bifocal Lenses.

DOR, H., Lyon (Les lunettes à double foyer, *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 385), praises the American styles of bifocal lenses as far superior to the European. He claims that the accessory lens should always be found in the internal inferior position, and should never reach the median line. C. L.

Practical Measurement of the Divergence of the Visual Lines, and the Determination of the Basal Line. Application in the Prescription of Lenses.

CAMPOS, Cairo (Mensuration pratique de l'écartement des lignes visuelles et détermination de la ligne de base. Application à la prescription des lunettes, *Revue Générale d'Ophtalmologie*, 1910, Vol. XXIX, p. 388), describes a method of measuring the divergence of the visual lines and the determination of the basal line by means of stenopeic disks. These are displaced until the object seems to be in the center of a single opening, which is the projection of the two openings. The distance separating the two openings gives the distance of the visual lines for the fixed point at the niveau of a plane passing through the openings. In determining the basal line,

a star is used instead of a more or less fixed point. The visual lines are, therefore, practically parallel. Therefore, the distance between the centers of the stenopeic openings represents the visual line.
C. L.

The Extraction of Nonmagnetic Metals from the Eye by Means of the Electro-Magnet.

Rollet (De l'extraction des corps métalliques intraoculaires à l'aide de l'electro-aimant, aciers et ferros peu ou pas magnétiques, *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 434), states that some shots are composed of iron, consequently all gunshot wounds of the eye should be tested by the magnet. He has studied the magnetic qualities of the different alloys of iron with carbon and different metals, e. g., nickel, which as the steel of commerce, come more or less into consideration in injuries to the eyes. He gives two tables illustrating the difference in the magnetic attraction of those various compounds. The greatest attraction is shown by the purest iron, the least, which is zero, by a compound of silicon, 44; aluminium, 16; ferrum, 40. As the pieces tested were all of the same size and weight, the difference in the magnetic attraction must reside in the character of the combination. Therefore, it is frequently not the fault of the magnet, but of the substance that an intraocular foreign body cannot be extracted. The size, shape and weight of the body greatly influences the attraction. For instance, an iron needle 2 centimeters long and weighing 2 centigrams, was attracted at a distance of 24 centimeters. Folded on itself, the distance fell to 20 cent. Folded again, it fell to 14 cent., etc. He describes the effects of magnetizing, and the influence of the electric current. He also describes the results of his experiments with pieces of iron introduced into the eyes of pigs.
C. L.

Vascular Graft to Re-establish the Extirpated Lacrimal Sac.

Rollet (De la greffe vasculaire pour restaurer le sac lacrymal extirpé, *Revue Générale d'Ophtalmologie,* 1910, Vol. XXIX, p. 481) makes a preliminary report upon his operation for restoration of the lacrimal sac. The steps are, (1) extirpation of the sac, (2) dissection of 1 centimeter around the median cephalic vein of the fore-arm, then cutting between the two ligatures, (3) a special probe is placed in the lower canaliculus, the depth of the wound and the nasal duct. The venous trunk is placed in the lacrimal recess, its lumen being traversed by the probe. The upper end is placed against the lacrimal canaliculus and the lower end against or within the nasal canal, (4) dressing. C. L.

Phlyctenular Ophthalmia in the Region of Nice.

Colin, A., Nice (L'ophtalmie phlycténulaire dans la région de Nice, *Revue Générale d'Ophtalmologie*, 1910, Vol. XXIX, p. 483), draws the following conclusions:

(a) Phlyctenular ophthalmia is very frequent in the region of Nice, and especially affects the Italian population.

(b) The true cause of this frequency is undoubtedly the poverty, bad hygiene and poor nourishment of the families of these children.

(c) The sun and the marine climate aggravates an already existing phlyctenulosis, but they help to build up the general health.

(d) Without direct heredity, the children are almost always scrofulous, chlorotic, anemic or feeble.

(e) The disease is often a grave affection. While rarely resulting in blindness, it often leaves leucomata, causing myopia, irregular astigmatism, etc. C. L.

Two Cases of Metastatic Ophthalmia Simulating Glioma Retinae.

Curtil, A., Lyon (A propos de deux cas d'ophtalmie métastatique simulant un gliome de la rétine, *Revue Générale d'Ophtalmologie*, 1910, Vol. XXIX, p. 539), reports the case of two children with metastatic iridochorioiditis resembling glioma. The clinical appearance even to a slightly increased tension was that of glioma, and history of infection elsewhere was lacking in one case and doubtful in the other. A discussion of pseudoglioma in general and these cases in particular follows.

C. L.

"606" and the Recent Progress in The Therapy of Syphilis.

Darier, A., Paris (Le "606" et les progrès récents en syphilothérapie, *La Clinique Ophtalmologique*, 1911, Vol. XVII, p. 57), speaks of the necessity of abandoning the use of arsarcetin, atoxyl, soamin, etc., on account of the eye injuries following their use, but recommends the use of Ehrlich's "606," because no untoward effect on the eye has been known to follow its use so far. To be sure, "606" has never been used in doses exceeding one gram, whereas with the remedies cited above as much as several grams were injected. The subjects for injection should be carefully chosen, and all those affected with serious diseases of the heart or blood vessels, persons suspected of being tuberculous, general paralytics or advanced tabetics, rejected. Tabes of recent date sometimes does very well. Darier does not put much faith in the ability of one injection to eradicate syphilis, but even then he welcomes the advent of "606" as a great addition to our means of curing and preventing syphilis. His plan would be to administer an abortive dose of "606" as soon as a syphilitic lesion is discovered, and to follow this, about a month later, with a series of mercurial injections, and to watch the patient carefully, a Wasserman reaction being tried every three to six months. He believes that the technic will soon be simplified to such an extent that any practitioner can make the injections of salvarsan, for which he favors the intravenous route, and recommends the sale of the remedy in ampoules of 10 grams, which would allow of its easy division. The large doses should be given only to robust individuals without other defects. M. W. F.

Sporotrichosis of the Eye.

Jocqs, R., Paris (La sporotrichose oculaire, *La Clinique Ophtalmologique,* 1911, Vol. XVII, p. 62), gives a résumé of the sporotrichosis literature and thinks that we shall now be able to classify under this head many cases which were formerly considered of a different nature, notably syphilitic or tuberculous. When the eyes are involved the most frequent seat is in the lids. Morax and Carlotti's case is well known. In Thieberg's and Gastinel's case there was a generalized sporotrichosis of the skin. In the face the lesions were situated around the left eye. Near the external canthus was an ulceration, which had spread over the lid to the root of the nose, and had continued in a crescentic shape to the malar region. This ulceration was very superficial, not depressed. The borders, which are surrounded by a pinkish zone, pass into the base of the ulcer without any sharp line of demarcation. The base is covered with hemispheric granulations, giving it the appearance of a papilloma. The free edge of the lid is infiltrated, thickened, not exulcerated, but the lashes have disappeared and there is a mild degree of ectropion. In the upper lid are two softened nodules, whose combined volume about equals that of a small bean. of a reddish brown color, with a violet hue. The palpebral conjunctiva is red throughout. This picture should be borne in mind in distinction from the case of Morax, in which there was no exulceration of the nodules.

To make the differential diagnosis between sporotrichosis and syphilis of bacillary infection, one should note that in sporotrichosis the lesions are indolent, and the ulcers surrounded by indifferent tissue. There is no thickening, no raw-ham induration as in syphilis, no sharpcut edges nor undermined borders as in syphilis; nor the branching grumi of tuberculosis. The history will prevent confusion with a broken-down chalazion. Rodent ulcer and chancroid have an easily bleeding base, and the edges and base are hard and thickened. After all, the microscopic examination and cultures on saccharine or glycerinated media are the deciding methods of establishing the diagnosis.

Attilo Fava, a pupil of Morax, received part of an emulsion of sporotrichum, which he was injecting into the vitreous of a rabbit, in his face and eyes. The period of incubation of the disease in the right eye was eleven days, in the left fifteen days. Then yellowish white spots appeared in a zone of conjunctiva, which was thickened and partially infiltrated with follicles. These spots, from the apices of which the sporotrichum could easily be obtained, were slightly sensitive on pressure, and gave rise to the sensation of a foreign body. There was a slight edema of the lids and some hyperemia of the conjunctiva. At the site of the first lash of upper lid was an ulcerating folliculitis and some desquamating dermatitis. Swelling of the angulomaxillary and preauricular glands ensued almost at once. Three days after the treatment with potassium iodide was begun the lesions showed a change which was especially marked on the seventh day.

A case reported by Velter shows the third modification of the disease. An abscess formed on the level of the outer half of the lower lid, simulating a cold abscess or a rapidly softening syphilitic gumma. Through an incision a large quantity of yellowish-brown, viscous fluid was obtained, resembling mucopus mixed with a small amount of blood. With the probe a denuded bone surface was found, which proved to be the infero-external orbital margin and the outer wall of the orbital cavity. Cultures showed the presence of sporotrichum. The preauricular gland was slightly swollen. The effect of treatment with iodide could not be determined, as the patient disappeared. The literature records two other cases of sporotrichosis affecting the bone and periosteum of the orbital skeleton.

A man with generalized sporotrichosis affecting skin, bones and joints presented also an iritis, which, while it differed in no way from an ordinary iritis, was accepted as a result of sporotrichosis on account of the other lesions present. Under the administration of iodide the iritis subsided very quickly, leaving, however, synechiæ and pupillary exudates.

The possibility of sporotrichosis must be borne in mind whenever we meet abscesses in the conjunctiva or on the lids which are accompanied by glandular swellings. The same is true of periorbital abscesses reaching to the orbital walls. Iodide in large doses seems to be a specific for this condition, which leads one to believe that very often these cases have been mistaken for syphilitic lesions. M. W. F.

The Frequency of Atropin Poisoning in Children.

Colin, A., Nice (La fréquence de l'intoxication par l'atropine chex les enfants ophtalmiques, *La Clinique Ophtalmologique*, 1910, Vol. XVI, p. 589), has observed a number of cases of mild atropin poisoning in infants and thinks that this must occur often, although no mention of it is made in eye literature. The symptoms, as described by him, are: Five to twenty minutes after instilling a solution of atropin the child's face becomes red and congested; sometimes this redness spreads to the chest and abdomen. The child continues to play as usual, and pulse, temperature and respiration remain normal. Prostration and even delirium, as so often noted in adults, does not occur in children. The parents, however, are often frightened by the redness of face and body, and hasten to the hospital with the child. In one to three hours the congestion makes way to the normal color, and no symptom of intoxication persists.

The author concludes that:

(a) Tolerance is rarely acquired, inasmuch as he has seen the symptoms appear in certain children after every instillation of atropin.

(b) The phenomenon is most often seen in children with phlyctenular conjunctivitis, that is to say, in children of a strumous diathesis, with diminished power of resistance.

(c) In warm weather the phenomenon is more frequent than in cold weather, although the number of children does not vary much between seasons.

(d) Children between two and seven years of age seem to be most often affected.

To avoid this condition Colin makes use of oily collyria or of a one per cent ointment of atropin. When the use of watery solutions cannot be avoided, he compresses the region over the puncta lacrymalia as long as the solution remains in the conjunctival sac. M. W. F.

Corneal Symblepharon Following Trachoma.

Sameh. Bey, Cairo (Le symblépharon cornéen consécutif au trachome, *La Clinique Ophtalmologique*, 1910, Vol. XVI, p. 592), relates the history of three cases of symblepharon anterius due to trachoma, which he selects from a total of thirty-two cases observed amongst 345,874 cases of eye diseases. (This same material contributed ten other cases of symblepharon anterius of non-trachomatous origin.) The first case described was that of a lady aged forty, an old time sufferer with trachoma, who had allowed an old woman to powder her conjunctivæ with sesquioxide of copper and to tie her eyes up for a week. The result was adherence of the upper lids to the corneæ over a large extent, with grayish infiltration of the corneæ below the pupillary aréas. After detaching the lids with a knife the granulations were treated with scarification, expression and rubbing with cotton soaked in a 1-500 solution of cyanide of mercury. Two weeks later an iridectomy downwards was performed, giving a vision of one-half.

In the second case a man of thirty-five had allowed his lids to be rubbed energetically twice in one week with a piece of sugar, and his eyes tied up afterwards. The right upper lid was adherent to the cornea over two-thirds of the pupillary area. In the third case, that of a woman aged twenty-five, there was columnar adherence between the upper lid and the middle of the cornea. This had come during the course of the trachoma without any unwarranted interference. The lid was seized with the lid-forceps and forcibly everted, which broke the adherence, and the cornea cleared up nicely after a month's treatment of the granulations. M. W. F.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

V. L. RAIA, M. D.,

PROVIDENCE, R. I.

Podophyllin as a Cause of Ocular Disturbances.

CHIARI, CESARE, (*Clinica Oculistica,* Anno XI, October, 1910). Podophyllin, which is a resinous substance obtained from the rhizome of podophyllum peltatum, produces characteristic alterations when it comes in contact with the eye. Sureau, in 1902, was the first one to publish observations in regard to this subject, and the year after Dr. De Rocca Serra reported other cases studied in the Clinic of Sureau. In all these cases the alterations had been limited on the conjunctiva, cornea and iris. Dr. Chiari has lately seen a chemist, who had to handle a large quantity of this stuff, affected with swelling of the lids, injection and chemosis of the conjunctiva, superficial infiltration of the both corneæ and iritis, photophobia and lacrimation. After these annoying symptoms had considerably abated, he found on the field of vision of both eyes a positive scotoma a little outside the blind spot, from the 20° to 38° toward the temple, which gradually disappeared, until everything became normal. V. L. R.

Ulcer of the Cornea with Hypopyon from Bacillus Pyocyaneus.

SALANI, CORRADO (*Annali di Ottalmologia,* July-August, 1910). This affection of the cornea, which is the result of infection, due ordinarily to traumatism, is of rare occurrence, few cases having been reported until now. It differs from the infiltration of the cornea called ulcus serpens, caused by the pneumococcus of Fraenkel, by the characteristic appearance which is very significant to an experienced eye.

The author has isolated the bacillus and by inoculation in animals has reproduced the disease.

The affection is characterized by the rapidity of the infiltration of the cornea, by the appearance of the large ulcer on it, by the large quantity of pus in the anterior chamber, by the yellow green color of this secretion. V. L. R.

Blindness from Occlusion of the Central Artery of the Retina. Complete Recovery of the Vision in Consequence of Repeated Paracentesis of the Anterior Chamber.

Bietti, Amilcare (*Annali di Ottalmologia,* Fasc. July-August, 1910). The patient, who was seen by the author at his clinic in Sienna, was a young man of 20. He had lost the sight of one of his eyes all of a sudden, and presented all the characteristic appearances of embolism of the central retinal artery (opacity at the posterior pole of the eye, a vivid red spot in the center of the macula, filiform arteries and pale disk). From complete blindness the sight began to return after the first paracentesis of the anterior chamber and became nearly normal when the operation had been repeated several times. Since von Graefe described the first real case of embolism of the central retinal artery all the cases of sudden blindness accompanied by characteristic alterations of the fundus oculi have been put in the same category. According to Schweigger and our author, embolism of the central artery of the retina is a rather rare affection, the symptoms in question being rather due to endarteritis proliferans or thrombosis of this artery of the eye. We can speak of embolus only when a microscopic examination has revealed the walls of the arteries normal and a special affection of the heart. Massage, iridectomy, sclerotomy and paracentesis of the anterior chamber have been used by different writers in this affection with good and bad results. V. L. R.

Two Cases of Siderosis of the Eye.

Casali, Angelo (*Annali di Ottalmologia,* Fasc. July-August, 1910). The author has contributed two cases to the literature of siderosis of the eye, and has with them confirmed the results of other writers. The disease is the consequence of the entrance of pieces of iron into the eye from traumatism, the dissolution of the same by the carbonic acid of the blood, and its precipitation in the different parts of the eye. The iris is the membrane most frequently affected, then comes the anterior crystalloid, the lens, the retina and lastly the cornea. The iris appears of a red brown rusty color, the pupil is larger than normal and sluggish, pigmentary and punctiform deposits below the anterior crystalloid are seen, the lens becomes opaque, the vitreous somewhat turbid and the retina degenerated, in many cases resembling retinitis pigmentosa. Some authors say that when the characteristic red brown color of the iris after an injury is present, diagnoses of steel in the eye can be made. The particles of iron which are taken specially by the epithelium of the retina, of the ciliary processes, have a deleterious effect on the different tissues, producing their degeneration. Consequently, when the symptoms of siderosis become manifest, even if the foreign body is successfully extracted, the eye is irrevocably lost. An exception to this rule is one of the two cases reported by our author, which, although showing marked rusty coloration of the iris and the anterior crystalloid, after the cataract extraction, regained very good vision. The subjective symptoms of this rare affection are decrease in the power of vision, a concentric contraction of the field of vision and hemerolopia which resembles that of ordinary retinitis pigmentosa. V. L. R.

A Rare Affection of the Tarsal Conjunctiva, Under a Membranous and Proliferating Form, Due to Chronic Diphtheria from Attenuated Loeffler's Bacillus.

MONTERISI (*Archivio di Ottalmologia*, October, 1910). A boy of seven years of age, after measles developed a membranous conjunctivitis, the membranes, after being artificially detached, reproducing themselves rapidly, first in one eye then in the other. A few days afterward a fungoid growth appeared on the tarsal conjunctiva, which, after excision and canterization, grew up again. Everything was tried, but to no avail, until Monterisi, having used several injections of diphtheritic antitoxin, became convinced that the affection was nothing but a chronic form of diphtheria of the conjunctiva. His bacteriologic and microscopic researches with the secretion of the conjunctiva and the excised growth have confirmed him in this belief. For several years writers have spoken of a chronic membranous formation due, according to many, to a pseudo diphtheria. The bacillus of this latter would differentiate from that of the true diphtheria by its different appearance under the microscope, its growth on different mediums and the lack of virulence. According to the majority of investigators, the germ is the same and under special conditions it may assume great virulence. The case reported by our author is unique in the literature of the subject, having to deal not with membranes of the conjunctiva, but with true papillomatous growths of the same, the consequence of chronic diphtheria. V. L. R.

A Case of Argyrosis of the Lacrimal Sac.

Ruata, Vittorio (*Archivio di Ottalmologia*, September. 1910). A patient had been treated for trachoma with a silver solution and after four years of these continuous instillations the conjunctiva, especially of the cul-de-sacs, had become dark brown. There was also purulent dacryocystitis, for which stricturotomy had been performed. The sac was extirpated and when opened showed the same characteristic appearance of argyrosis noticed on the conjunctiva. The microscopic examination revealed that the pigmentation was circumscribed to the elastic fibers of the mucous membrane, the same disposition which has been found in argyrosis of the conjunctiva. The author agrees with the other writers, to explain this fact, by saying that the elastic elements have a chemical affinity with the albuminate of silver, the ultimate result into which the preparation is transformed, after repeated and prolonged instillations. V. L. R.

A Singular Case of Complete Detachment of the Epithelium of the Cornea with Subepithelial Hemorrhage Following Burn from Quicklime.

Ruata, Vittorio (*Archivio di Ottalmologia,* October, 1910). A man, 42 years of age, while working got some quicklime on his right eye, from which the corneal epithelium was destroyed. The surface of the cornea soon became smooth and normal and, when in this condition, the epithelial layer began to detach until the detachment involved the whole membrane. A big vesicle was formed full of blood which had its origin from a rupture of blood vessels at the periphery of the cornea. Presently the epithelium gave away in the middle and from the discontinuity blood poured out. A pressure bandage was applied and the epithelial layer gradually united with the underlying tissues of the cornea. The agent which had destroyed the epithelial surface affected also the Bowman's membrane, and this explains the pain to which the patient had been periodically subjected and the separation of the epithelium up to the periphery of the cornea. This affection has some kind of relation with what has been called by the French writers neuralgic vesicular intermittent keratitis, and which is due ordinarily to slight traumatisms of the cornea. In the present case the trauma was represented by a chemical agent which produced the loss of the corneal epithelium and the lesion of the Bowman's membrane. To this latter alteration is due the pain suffered by the patient and the detachment of the epithelial layer.

Two Cases of Epithelioma of the Lids and Skin of the Nose Cured with Active Principle of Jequirity.

Nobile, Luigi (*Annali di Ottalmologia,* Fasc. September, 1910). Rampoldi's method of treating epithelioma in all its stages has been confirmed by numerous other cases reported by Cattaneo, Denti, Fumgalli, Bialetti, Farina in Italy, and Shoemaker in America. Our author adds to this list two new ones, which further prove the great benefit of the applications of the different preparations of jequirity. In the first case there was an extensive epitheliomatous ulceration of the inner corner of the right eye without implication of the conjunctiva and eye globe, which had resisted all the other ordinary treatments. Several applications of gelatinous jequiritine disks and intraparenchymatous injections of Zambelletti's fluid extract completely and permanently cured the patient, who has now a normal palpebral commissure and is able to open and close the lids, a thing which was impossible before this treatment. In the second case the epithelioma was situated on the dorsum of the nose, was of a considerable size, ulcerated, of one year duration and totally disappeared with gelatinous disks applied on the tumor and injections at the base of fluid extract of jequiritine. From the results of these two cases we can conclude that the cutaneous epithelioma is positively cured with jequirity, that this is of very easy application, without danger, attacks only the neoplastic infiltration and completely spares the sound tissues, from which, through reaction, a neoformation of connective tissue takes its place. V. L. R.

SOCIETY PROCEEDINGS.

BY

T. B. HOLLOWAY, M. D.,

PHILADELPHIA.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting November 18, 1910. Dr. William Zentmayer, Chairman, presiding.

Avulsion of the Eyeball.

Dr. Mary Buchanan (by invitation) presented an eye that had been gouged out by an insane patient, aged fifty-one years, suffering from involutional melancholia. For several weeks the patient had made repeated requests to have her eyes removed and her head cut off. One night the patient succeeded in enucleating her own left eye, and in answer to an attendant, who inquired concerning her eye, she replied, "There it is on the window sill." Dr. Buchanan thought the specimen was remarkable for the neat way in which the muscles and optic nerve were severed close to the eyeball, and stated that, with the exception of a grooved abrasion of the conjunctival surface of the upper lid, the orbital tissues were in fair condition after the crude operation. No infection followed the removal of the eye.

Dr. Zentmayer said that Dr. Buchanan's case was exceptional in that the avulsion was complete. More commonly the globe is still attached by fibers of one of the muscles, usually, he believed, of the inferior rectus.

Acetylene Gas Lamp.

Dr. G. Oram Ring exhibited a portable acetylene surgical gas lamp. Its weight is about 15 ounces and height 3½ inches; candle power, about 30. Expense of running it is said to be less than one cent an hour. It has a rod or arm attachment, making it possible to utilize it on a bed or chair. It emits a pure white light, without flickering, and from the standpoint of the ophthalmologist is considered most desirable as an addition to one's surgical bag for house or hospital ward use. The chimney or tube is brass nickeled, with reflector.

The anterior segment of the eyeball can be perfectly illuminated—the fundus examination made without difficulty—and notwithstanding the brilliant whiteness of the flame, the fundus tint is not at all abnormally bleached. It can be readily used for rhinoscopic purposes.

A gas-cock key is attached, so that the size of the flame can be perfectly regulated. The gas (C_2H_2) is generated from carbide crystals, and the lamp has been subjected to almost every possible test without evidencing any explosive tendency.

Papilloma of the Conjunctiva.

Dr. Krauss reported a case of papilloma of the conjunctiva, one of the rarest benign growths of this membrane. It occurred in a man aged forty-seven years. The growth, which arose from the middle of the upper lid near the fornix of the left eye, was the size of a large cherry, deep red in color, and covered with numerous papillæ. According to the patient's story, it had been present for fifteen years, but began to grow more rapidly after an attack of iritis five years ago, assuming the large proportions only for the past few weeks.

Excision was made as complete as possible to prevent recurrence. The microscopic findings were those of a papilloma. There was a central mass of fibrous connective tissue with numerous papillary projections, some of digitate shape, others thick and lobose, separated by clefts, into which the surface epithelium extended. There were several large sebaceous glands embedded in the connective tissue, which in places showed cystic changes with degeneration and necrosis of the neighboring cells of the gland. In a few instances, active proliferation, with extensions of masses of these cells into the surrounding stroma, had occurred, and in two of these instances there were appearances of "cell nests," as in squamous epithelioma.

Blood Vessel Floating in Vitreous, Associated with Coloboma of Chorioid.

Dr. Crampton presented the case history of a healthy girl, aged nine years, having a partial coloboma of the iris and chorioid of the right eye, associated with a fine patulous blood vessel, which was seen to pass forward over the floor of the coloboma from the periphery of the fundus. Before reaching the apex of the coloboma the vessel separated from the retina and, forming a shepherd's crook, floated freely in the vitreous and terminated in a minute mass of pale gray tissue. The origin of the vessel was lost in the peripheral portion of the coloboma. The vitreous was clear and showed no remnants of the hyaloid artery. The father was a high myope, but otherwise the family history was negative. The patient gave no history of injury or disease. Vision was 3/60 in each eye. Under duboisine, a + 4.25 sph. = + .75 cyl. ax. 75 and a + 5.00 sph. = + .75 cyl. ax. 165 gave a vision in right and left eye, respectively, of 6/15 and 6/9.

A Self-Contained Electric Ophthalmoscope.

Dr. Crampton demonstrated a magazine ophthalmoscope handle containing a two-cell dry battery, which, when used in connection with a tungsten lamp, gives a light of marked brilliancy. The battery handle can also be used with a retinoscope or a transilluminator tip, lamps of suitable power being adapted to each instrument.

The battery, in the form of a round rod, is ⅞ of an inch in diameter and less than 4 inches long. Like all dry batteries, they slowly deteriorate, whether in use or not. Although the life of the battery seems disproportionate to its size, a little care in turning off the lamp when not in use will well repay one for the trouble.

Dr. L. F. Appleman stated that he had had occasion to use the ophthalmoscope which Dr. Crampton presented, but found difficulty in seeing the details of the fundus clearly owing to a reflex produced by the cone of brilliant light against the central portion of the mirror, and asked whether some means could not be devised whereby the light could be uniformly distributed over the surface of the mirror.

Dr. Zentmayer inquired concerning the life of the battery.

In reply to Drs. Appleman and Zentmayer, who spoke of the annoying reflections due to the light striking the upper edge of the sight hole, seen in all electric ophthalmoscopes having a central aperture in the mirror, Dr. Crampton, while admitting the imperfection, said he knew of no way of preventing it other than by using a slotted mirror, which, however, has the disadvantage of giving an unequally illuminated field.[1]

Rodent Ulcer of the Cornea, with Histological Demonstration.

Dr. G. E. de Schweinitz described two cases of rodent ulcer of the cornea, with removal of the eyeball in one instance, the subject of the lesion having been a colored man, aged about forty-five years. The disease appeared to have started in an injury of the left eye from a piece of wood, and gradually all of the lesions characteristic of rodent ulcer of the cornea developed. This began at the upper edge of the cornea and gradually crept across, involving more than half of this membrane. The ulcer was separated from the healthy portion of the cornea by a gray opaque rim, deeply undermined. There was also a deep undermining of the conjunctival edge of the ulcer. The patient was first seen five months after the disease began, when the ulcer had already involved more than one-half of the corneal surface. All manner of treatment was tried, notably frequent applications of the actual cautery, and although there was no marked progression, there was also practically no improvement, and as the patient was grealty depressed, and unable to work, he requested the removal of the eye. This was done, and the lesions found were as follows:

The cornea, as a whole, was depressed, the middle of it lying well down upon the lens and iris. The corneal epithelium was irregularly thickened, and except for a couple of islands of stratified squamous epithelium beneath its surface, presented no abnormalities. In the region of the pupil the epithelium had become invaginated beneath a mass of fungated connective tissue elements arranged in lamellations. A prominent feature of the specimen was the dense infiltration of the cornea on either side of this thinned area and of the sclera, slightly beyond the corneoscleral junction, by fairly large round connective-tissue cells. The ciliary body and iris had not shared in the disease. The lens, iris and ciliary body, retina and nerve were normal. The appearances of the sections closely resembled those pictured by Lister in his description of the microscopic lesions of this disease. Numerous cultures taken from the ulcer prior to enucleation of the eyeball were either negative or else contained only the ordinary cocci, and nothing resembling Andrade's bacilli was discovered.

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[1] Since the meeting Dr. Crampton has reported that in an improved form of the instrument, in which the upper side of the sight hole is shaded by a tiny metal quill protruding through the opening, the reflections appear to have been overcome entirely, and by means of a sliding sleeve, the distance from filament to mirror being variable at will, a graduated light is obtainable.

The second case occurred in a woman, aged seventy-eight years, of feeble constitution, and presented all of the characteristics of the one which has just been described. In this instance the usual local applications and cauterants were negative in their results. At least, the progression of the ulcer was not stopped, although it was extremely slow, and at the time the patient came under observation had been in existence for many months. In addition to the corneal lesions in this patient there was distinct iritis. The only application which appeared to do any good, and which afforded the patient considerable relief, was that preparation which has been described by Dr. Arthur E. Ewing as "a useful and mild caustic," and which consists of resorcin, salicylic acid, carbolic acid, oil of lavender, oil of bergamot, and alcohol, the formula for which may be found in the *American Journal of Ophthalmology*, May, 1910. The case is still under observation, and therefore the ultimate results cannot be stated.[1]

Dr. S. D. Risley thought it fortunate that cases of rodent ulcer of the cornea were so rare. He could recall but two cases occurring in his experience, both of which were at the Wills Hospital, and in aged colored people. In one of these no treatment proved of any help, and the man passed from observation. In the second, an old and feeble colored woman, after other methods of treatment had failed, he carefully curetted the ulcer throughout its extent and cauterized it with trichloracetic acid, carrying the drug thoroughly under the overhanging borders of the ulcer. In this case it proved curative. The ulcer healed, leaving a white cicatricial band. The same treatment, however, had been useless in the other case. Dr. Risley thought we should use the galvanocautery at the limbus of the cornea with great caution. A white heat should never be employed. He had seen three cases in consultation in which a lack of caution, he thought, had been rapidly followed by violent attacks of iridocyclitis, resulting in loss of the eyeball.

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[1] Since this was written the eye has been enucleated, as the patient could no longer endure the pain and depression.

Dr. Ziegler confirmed the value of Ewing's solution in these sluggish lesions of the cornea, as well as in neoplasms. He had found, however, that cicatrization was greatly promoted by applying formalin, 1 per cent solution, immediately after applying Ewing's solution.

Dr. Zentmayer stated that his experience with rodent ulcer was limited to one case, seen in a farmer, aged sixty-four years. The ulcer had all of the characteristics of this type. It was complicated by an iritis, and the pain was severe. The course of the case seemed self-limited, as none of the long list of remedies which were tried appeared to have the least beneficial influence. The actual cautery was used repeatedly and its failure to arrest the progress of the ulcer was particularly disappointing, as Fuchs states that before the use of this method these ulcers involved the whole cornea, but since the introduction of it the disease could be arrested in its incipiency. Carbolic acid, trichloracetic acid, and Bier's hyperemic method were all repeatedly tried, and failed. The only remaining clear part of the cornea was a small area below. V. = counting fingers at 1 m.

Epibulbar Papilloma Apparently Originating from an Injury.

Dr. G. E. de Schweinitz briefly described the case history of an epibulbar papilloma which he had removed from the right eye of a man aged sixty-five years, as follows: The growth, somewhat crescentic in shape, was situated along the inner border of the corneoscleral junction of the right eye, extending from the center of the upper border around the inner margin to the center of the lower border. Directly in its middle, on a line with the internal rectus muscle, it was depressed, owing to the presence of a small pterygium, in such a manner that the growth appeared to arise in two halves, extending from the upper and lower border of this pterygium. It was attached by a broad base, which encroached for 3 mm. on the corneal surface, and 5 or 6 mm. on the bulbar conjunctiva, was smooth on its surface, and of a reddish-yellow color, a number of injected conjunctival vessels surrounding its margins. The growth was excised from its bed, and the conjunctiva, loosened on each side of it, drawn over to fill the gap produced by the dissection. Healing was uneventful, and the patient left the hospital at the end of a week with a perfectly cured eye, which in other respects was normal.

Sections of the growth cut by Dr. Saxon in Dr. de Schweinitz's laboratory were exhibited and had the following characteristics: Externally, there is a layer of stratified squamous epithelium aranged in a papilliform manner, while between the papilla there is a rather dense connective tissue growth. This layer of epithelium surrounds an area consisting for the greater part of dilated capillaries and arterioles filled with blood cells. The remainder of the growth is composed of myxomatous and connective tissue. The epithelial elements are in no sense infiltrated and have a definite relation to the basement membrane. Many of the cells show distinct chromatin filaments in their nuclei, and in one spot there is an appearance of pearly body formation.

Dr. de Schweinitz briefly referred to papillomas of the cornea, especially to those which had started at the limbus and invaded the cornea. He also pointed out that papilloma of the conjunctiva, as in his case, usually occurred in the neighborhood of the caruncle and the plica, and that such papillomas were apt to recur after removal, and although they grow outward without invasion of the deeper tissues, it is a well-known fact that they sometimes become malignant. His patient maintained with great positiveness that the growth had begun to appear after his eye had been injured by coming in contact with the fin of a fish, which struck him violently in the corner of the eye, and occasioned primarily a sharp traumatic conjunctivitis.

Bilateral Partial Tenotomy, with a Greek Cross Test-Object for Use During Operation.

S. Lewis Ziegler stated that partial tenotomy had become a well-recognized procedure in cases where prisms had failed to give relief. It was originated by von Graefe (1861), revived by Abadie (1880), perfected by Stevens (1883), simplified by Ziegler (1891), elaborated by Verhoeff (1893), and modified by Todd (1907).

Dr. Ziegler said that some surgeons preferred complete tenotomy with suture, but this exposed the patient to the danger of a faulty reattachment of the muscle, of an axial rotation of the eyeball, or a marked overcorrection of the error from slipping of the sutures. The ultimate object of partial tenotomy, as applied to low-grade errors, was to secure orthophoria through an operation that would permit us to obtain minutely graduated effects without the danger of producing torsion of the globe. This could be best accomplished through a bilateral partial tenotomy, with the preservation of a central fasciculus that could be thinned down until a measurement of orthophoria was secured.

Operative Technique. The conjunctiva is incised, the tendon made tense with the hook, and each lateral third of the tendon completely divided. The remaining or central third is then gradually clipped across the top until relaxation is felt. The speculum is removed and the result measured by the Graefe test. If necessary, the clipping is repeated until orthophoria is secured. If the error is large, the correction should be divided between the two eyes. An effect ranging from ½° to 8° may be secured with proper care. By the employment of this method the motility of the eyeball is undisturbed, the traction power of the muscle is retained, its insertion is unchanged, and vertical tilting of the axis is avoided.

The use of the illuminated Greek cross test-object will enable the operator to make reliable measurements by the Graefe method in spite of the corneal haze resulting from blood and cocaine. There is complete dissociation of the two images and the patient can accurately line up the vertical deviation by the horizontal arms of the cross, or the horizontal deviation by the vertical arms of the cross.

Dr. de Schweinitz, commenting on Dr. Ziegler's important and interesting communication, asked whether, in his investigations of von Graefe's relationship to partial tenotomy, he had ever found a statement by von Graefe retracting his recommendation of the operation which he had once advised. Dr. de Schweinitz asked this question because he remembered Herman Knapp's statement, who, referring to partial tenotomies, had said: "Von Graefe tried them, as I did also, at the beginning of my practice, but when, in conversation, I told von Graefe of these operations, he answered: 'You will not do them very long.'" This seemed to Dr. de Schweinitz to indicate that von Graefe himself had become dissatisfied with the operation of partial tenotomy.

Dr. S. D. Risley congratulated Dr. Ziegler upon the ingenious technique of the operation he had described so clearly. All of the attempts he had himself made to secure results by partial tenotomy had failed. He was inclined to the belief that Dr. Ziegler's success in his procedure was due to the thorough detachment of the tendon from the underlying sclera by the rending of the attaching connective-tissue fibers with the strabismus hook. This permitted the stretching backward of the fibers of the tendon. After testing many methods, he had finally adopted the method of carefully cutting the entire tendon from its attachment or insertion without the use of a strabismus hook. He then controlled the degree of retraction of the tendon from its line of original attachment by the extent of release afforded by cautiously snipping the underlying fibers which bind its under surface to the sclera. But little if any result is secured by a simple division of the tendon.

Dr. Ziegler, replying to the query of Dr. de Schweinitz, said that there was no evidence in von Graefe's writings that he had recanted his views as to partial tenotomy. He could not have known of Stevens' work, in 1883, since he died in 1871. His repeated references to this subject shows how important he considered it. Dr. Ziegler believes that partial tenotomy is a most valuable procedure and that the bilateral incision with a central fasciculus will prove to be the safest and most accurate method.

Subsiding Disseminated Chorioiditis of Luetic Origin.

Dr. T. B. Holloway cited the case history of a male, aged forty-nine years, who had been under treatment at the Univesity Hospital since October, 1909. The patient gave a history of having contracted an initial lesion about January, 1909, that was followed by the customary secondary symptoms. He first detected an impairment of vision about July 1, but he did not come under ocular observation until October. At this time the vision of the right eye was 4/22, while that of the left eye was reduced to the counting of fingers. There was no injection of either eye, but each cornea showed a fine pin-point deposit on its posterior layer. In each eye there were numerous vitreous opacities, preventing a satisfactory view of the fundus details. It could be made out, however, that the disk edges were blurred and that the vessels on the disk were contracted. He was given inunctions and sweats with the internal administration of potassium iodide. The vision gradually improved until on November 1, 1910, when his condition was as follows:

The vision of the right eye was 6/12; of the left, 6/22. Each disk was atrophic, having a yellowish tint; the retinal vessels were contracted, especially the arteries; the maculæ showed a granular retinochorioiditis; in the periphery of each eye were a number of chorioidal lesions, many of which were situated beneath the retinal veins, and in several places these lesions were linked together, resembling a string of beads. Dr. Holloway referred to the patient whose case history had been reported by Mr. Nettleship in 1909, where chorioidal foci had been observed to occur in chains and follow exactly the course of the retinal veins. In the patient presented by Dr. Holloway there had been at first a large central scotoma in the left eye and a paracentral scotoma in the right eye, whereas the fields taken on November 1, 1910, show that the form fields were practically normal, the color fields contracted; in the right eye there was a reversal of the red and blue fields, while in the left eye the blue field exceeded that of the red only in the temporal field. There still persisted a vague relative scotoma directly at fixation.

Tuberculosis of the Anterior Segment of the Globe.

Dr. Zentmayer exhibited the patient who was shown before the Section last spring with tuberculosis of the anterior segment of the globe. At that time there was present a severe uveitis with pupillary occlusion. Areas of infiltration in the cornea, the result of extension of scleral inflammation; hypotonus and V. reduced to finger counting. Under tuberculin treatment the cornea cleared greatly, the pupillary membrane has absorbed. Tn. and V.=5/20.

Meeting December 16, 1910. Dr. William Zentmayer, Chairman, presiding.

Detached Retina with Rupture Along Region of Ora-serrata Caused by Vomiting.

Dr. Crampton exhibited a highly myopic man, aged thirty-nine years, who gave no history of traumatism other than that due to severe vomiting caused by digestive disturbances. He sometimes vomited until he "saw stars."

The previous and present family history is negative and there is a plausible denial of specific disease. Eight months ago after vomiting he noticed a floating spot on the upper temporal quadrant of his right glass, and soon the entire visual field of the right eye began to undulate. The vision failed rapidly and is now reduced to that of moving objects, while the other eye, which aside from the presence of vitreous opacities and a myopia of about 14.D. is practically normal, has a corrected vision of 6/21. In the right eye there is a floating detachment of a considerable area of the retina, situated in the anterior lower portion of the fundus. With the pupil fully dilated, the retina is seen to be ruptured for some distance along the region of the ora-serrata and one can readily see beneath it as under a tent.

Lymphangioma of the Conjunctiva.

Dr. G. E. de Schweinitz described the histological characteristics of a small epibulbar growth which he had removed from the left eye of a man, aged forty-eight years, situated down and slightly out from the cornea on the bulbar expansion of the conjunctiva, but unattached to the cornea itself. It was red in color, 18 mm. in length, and 5 to 6 mm. in breadth. Covered by and connected with the conjunctiva, it was readily dissected from a lightly attached base, and was composed of a tissue which in some spots resembled myxomatous tissue, but for the most part was made up of a loose connective tissue, with large cavernous dilatations, somewhat resembling vessels, and which it is believed represented dilatations of lymphatics. These spaces contained absolutely no blood, nor was there the least trace of blood in the tissue outside of them. Dr. de Schweinitz intends to make some additional studies of this growth, which he did not feel had been with entire accuracy classified, and to present them at a future meeting.

Chancre of the Eyelid.

Dr. William T. Shoemaker showed a case of *Chancre of the Eyelid* and called attention to the difficulty of diagnosis of such lesions in the early stages, and consequently the importance of care in the handling of all cases. suspicious or not, as a safeguard against syphilis insontium. The case shown was a married woman, aged thirty years. The infection was probably immediate from her husband. The lesion showed first at the inner angle of the upper lid of the right eye and looked exactly like a hordeolum. It later spread to the lower lid and involved the entire inner angle. The preauricular and submaxillary glands on the same side were considerably enlarged, and the swollen preauricular gland was noticed by the patient before the eyelid lesion. There was little or no ocular disturbance beyond the immediate area of the chancre. The Spirochæta pallida was found and demonstrated by Drs. Uhle and Mackinney.

Dr. Shoemaker referred to the essay and statistics of J. Duncan Bulkley on "Syphilis in the Innocent." From this author it would seem that *extra-genital* chancres probably form 10 per cent. or more of the whole number, and of extra-genital lesions, over 4 per cent. are of the eyelids and conjunctiva.

It has been shown that the spirochæta lives under favorable circumstances but a few hours (perhaps four or five), a very important factor in protecting us from the widest kind of a distribution of innocent syphilis.

Dr. A. A. Uhle stated that extragenital chancre was of rather frequent occurrence. During the past six weeks he had observed five patients with extragenital chancres, three of whom were exhibited. Dr. Shoemaker's patient was the first patient he had seen with a chancre of the eyelid. A healthy-looking, granulating, indurated ulcer that does not respond to usual treatment, should always be regarded with suspicion. In the early stages, before induration was present, it was difficult to make a clinical diagnosis, and it was at this time that physicians were most likely to be infected. While it was formerly our practice to await the appearance of secondary manifestations, to make a positive diagnosis, this no longer is necessary. The Spirochæta pallida can readily be demonstrated by the ultra microscope, and in many instances by staining methods, at any stage prior to the characteristic changes, which make its clinical diagnosis possible. In the Wassermann reaction we possess also a valuable means of early diagnosis; in our experience it has been uniformly positive after the third week. The ultra microscope is the most positive means of making an early diagnosis. The preparation of the slide for examination, the description of the organism and its demonstration, he reserved for Dr. Mackinney.

Dr. W. Mackinney (by invitation) emphasized what Dr. Uhle had said relative to the value of the ultra microscope in the early diagnosis of syphilis. In his experience it has been uniformly positive, not only in chancres but in untreated secondary lesions, such as mucous patches, condylomata, macules, papules, etc. This method recommends itself particularly because of its easy application, as but a few minutes are required for the detection of the Spirochæta pallida, when the material for examination is properly obtained. A smear made from the surface of the ulcer, usually gives negative results, but when the ulcer is rubbed clean with a piece of dry gauze and the serum is obtained by firmly compressing the ulcer, without obtaining too much blood, the spirochæta are readily demonstrated. The length of this organism is generally two or three times the diameter of a red corpuscle, it is extremely thin and delicate, having numerous spirals tightly wound and uniform throughout, which readily distinguishes it from spiral organisms such as the refringens, dentium, and buccal varieties. The convolutions vary in number from fifteen to twenty-six; the organism under the microscope has seventeen distinct spirals. The preparation exhibited was made from the chancre of the eyelid exhibited this evening by Dr. Shoemaker. It can be observed that it has a motility which is very characteristic, moving rapidly upon its long axis, at times bending sharply at various angles, but moving very slowly across the field, remaining in the field for a long time. They preserve their motility for several hours in a preparation of this kind.

Later History of a Previously Reported Chancre of the Conjunctiva.

Dr. G. E. de Schweinitz, after referring to a chancre of the ocular conjunctiva which he had reported to the Section twelve years ago, briefly detailed the subsequent history of the case, namely, that after six months of treatment the original lesion had disappeared, that the entire upper half of the cornea showed a typical pannus, almost exactly as it occurs in granular lids. Scattered between the thickly produced vessels the corneal epithelium was hazy, but neither vessel nor haze appeared below the pupil space, and vision was only 6/60. For a month pannus increased in spite of active treatment, then gradually subsided and the patient disappeared from observation, to return again at the expiration of seven years, when after the correction of a mixed astigmatism vision rose to 6/12, and the only remnant of the previous corneal lesions were a few small irregular opacities, and one or two chalky-looking scales. This satisfactory result continues at the present time.

Dr. de Schweinitz referred to the well-known fact that in a certain number of instances a keratitis in acquired syphilis in all particulars resembling a true parenchymatous or interstitial keratitis has followed lid or conjunctival chancres, and thought that in recording the sequels of chancre of the conjunctiva we should add to these corneal lesions which may develop and which depends upon the formation of new blood vessels between the corneal epithelium and Bowman's membrane, in all respects conforming to the pannus of granular lids.

Transitory Decrease in the Static Refraction of the Eye in Diabetes.

Dr. William Zentmayer read a paper upon "Transitory Decrease in the Static Refraction of the Eye in Diabetes." The patient was a woman, aged fifty-eight years, who had been under treatment for glycosuria for three weeks by Dr. H. M. Fussell. She was first seen by Dr. Zentmayer October 4, 1909. There had been rapid loss of vision for ten days so that she could see better at a distance with her reading glass than with the naked eye. Glasses had been worn for six years for near-work only.

O. D., V. = 6/60; O. S., V. = 6/60. Visual fields practically normal. T. of O. S. + ?.

Ophthalmoscopic examination: Media clear, marked degree of retinal arteriosclerosis changes confined to the vessels.

O. D. + 2.50 ⌢ + 0.25 cyl. ax. 165° = 5/5; O. S. + 250 ⌢ + 0.50 cyl. ax. 15° = 5/5; 2.50 added. Type 0.37 pp. 25 cm. On the following day the cylinder was rejected, but the vision was the same.

October 26 there was no change in refraction, vision, or fundus.

November 8, O. D. + 1.25 = 6/5 pt.; O. S. + 1.25 = 6/5 pt. Accommodation unchanged.

January 17, 1910, O. D. + 0.50 = 6/5 pt.; O. S. + 0.70 = 6/5 pt. Accommodation unchanged.

The percentage of sugar had been 5 per cent., but was lessening at the time vision failed and had been absent from the urine for two days previous to October 4, 1909.

Dr. Zentmayer stated that the theories which had been advanced to explain this change were: alteration in the index of refraction of the lens, the vitreous or the aqueous; alteration in the curvature of the cornea; dehydration of the vitreous and paresis of accommodation whereby latent H. becomes manifest.

Three conditions are known to occur in diabetes which have a bearing upon these theories: Transitory M.; paresis of accommodation and cataract. The fact that in several cases the previous refraction of the eye was known, that in several there was no paresis of accommodation present, that the other dioptric changes which occur in diabetes have to do with the lens indicate that in this condition also. the change is in the lens—probably, as suggested by Van der Brough, Grimsdale and Randall, an increase in the index of refraction of the cortical layer whereby the entire lens becomes more homogeneous.

T. B. Holloway, *Clerk.*

CHICAGO OPHTHALMOLOGICAL SOCIETY.

A regular meeting of the Society was held November 21, 1910, with the President, Dr. W. A. Fisher, in the Chair.

Congenital Absence of Optic Disk.

Dr. Clark W. Hawley presented a girl, aged 12, who complained of failing vision, first noted five years ago. Retinoscopy showed mixed astigmatism. Correction did not improve vision, except to make it brighter. The fundus showed the blood vessels as in the normal, but entire absence of the disk. There was no sign of an exudate. The retina and chorioid were clear and distinct. None of the blood vessels were obscured. In the left eye, especially, there was a peculiar reflection along the blood vessels which looked like an exudate, but it changed its shape and position. The circle of light could be followed through the vitreous and there was a reflection from the vitreous, but by careful watching one could see the blood vessels in nearly all directions. It was evident, he said, that there was a congenital malformation in the posterior portion of the eye. The visual fields were not reduced.

Discussion.—Dr. Thomas A. Woodruff called attention to an article by C. H. Beard in the *Ophthalmic Record* for June, 1901, in which was reported a case of absence of the optic disk simulating choked disk.

Dr. Brown Pusey thought that he could see the outlines of the nerve-head in the right eye.

Dr. E. V. L. Brown was unable to find any evidence of a disk, but he thought that the vitreous was changed quite a little and suggested that there might be present a remnant of the embryologic vitreo-glial structure, which might account for the condition. The type of disk corresponds to type one of Elsnich's classification. There might be, he said, some change in the transparency of the normal glia both in the vitreous and retina.

Lymphangiectasis Multiplex.

Dr. J. F. Burkholder reported the case of a woman, aged 30, who complained of headache, failing vision and a feeling of roughness in the eyes of three or four weeks' duration. Vision was: O. D. 20/50; O. S. 20/60. Glasses relieved the headache, but were not comfortable. The bulbar conjunctivæ of both eyes showed many straight chains of multiple, moniliform injections or dilatations radiating outward from the cornea to the fornix, and measuring about .75 mm. in diameter. Pressure emptied these dilatations of a colorless fluid. There was no evidence of conjunctival injection. There was also marked corneal disturbance. A curved band of infiltration, 2 mm. wide, extended horizontally across the left cornea, the convexity facing downward, the upper border passing across the lower pupillary area. This band was nebular in character. The cornea was not rough. It extended to the sclera on either side, where there was slight vascularity. The right cornea was clear, except for a small phlyctenular elevation at the nasal corneo-scleral margin in the region of the palpebral fissure. This was circumscribed by a narrow area of vascularity with its greatest width on the scleral side. This became vascular, then pustular and finally broke down, leaving a marginal ulcer, which was exceedingly persistent.

Modification of Schiotz Tonometer.

Dr. H. Gradle exhibited an instrument that differed from that of Schiötz in mechanical detail only. The foot-place is somewhat smaller; the stylet is only 2½ mm. long, and the exchange of weights is more simple. The least imperfection, even an erosion of the cornea, is registered by the instrument.

Lymphocytosis in Perforating Eye Injuries.

Dr. H. S. Gradle has examined the blood of patients who sustained a perforating wound of the eye and where other causes of leucocytosis could be excluded. He divided the cases into three classes. In the first class there were eighteen cases, in which the injured eye was removed because of the fear of sympathetic ophthalmia. In each case there was an increase in the number of mononuclears of from 20 to 80 per cent. In the second class were twenty-one cases, where the wound healed spontaneously, or where the eye had to be enucleated on account of early panophthalmitis. In all these cases the blood was normal. In the third class were thirteen cases of iridocyclitis of various forms which could in no case lead to sympathetic ophthalmia. The blood was normal in every case. He said that in cases of perforating injuries which would lead to a sympathetic ophthalmia and where the mononuclears are decidedly increased an acute aggravation of the iridocyclitis is at times shown thirty-six to forty-eight hours before the clinical manifestations by a further increase in mononuclears of at times 20 per cent. Within two to four days after enucleation of the injured eye the blood count falls to normal and remains there.

Discussion.—Dr. H. Gradle has followed this in his own practice recently. The first two instances were very striking. The first case was a perforating injury resulting in a rent through the cornea, exposing the anterior chamber and two or three smaller rents which did not perforate. The larger wound remained open for five or six days. Although the lens was not injured, the clinical aspect was threatening, due no doubt, to the infiltration caused by all injuries. The wounds healed slowly. The blood count was normal and the patient recovered without any permanent injury except a blur from the central scar running through the middle of the pupil.

In the second case a wire passed through the cornea into the lens. The eye did well except for some flushing when it was exposed to the light. Toward the end of the sixth week a few spots of keratitis punctata appeared. The eye was enucleated. During the entire six weeks the blood was as reported by Dr. H. S. Gradle. In three other cases the blood count was normal with slight daily fluctuations.

Dr. E. V. L. Brown referred to the opinion given by McElroy, of the Moorfield Clinic, that the infiltration is a plasma cell infiltration rather than a mononuclear leucocytosis. The observation has been uniform in eighteen or twenty cases. In Fuchs' Clinic these cases have not been checked up on account of the improper stain used. However, the plasma cell infiltration was a typical one. "If," he said, "the lymphocytosis can be shown to be a constant differential point between an eye that may cause sympathetic inflammation and one which will not, it is exceedingly valuable."

Dr. Gradle, in closing, said that Dr. Ormond, of Guy's Hospital, London, working independently, found the same thing, but he maintains that the increase was due to the large lymphocytes and not the small ones. However, this is a difficult matter to determine, and is really one of personal equation. Dr. Gradle has used the differential stain for plasma cells, but at no time has he found anything resembling them, either Ehrlich's variety or Tuerk's Reitzungs or irritation forms.

A regular meeting was held December 19, 1910, with the President, Dr. W. A. Fisher, in the Chair.

A Case of So-Called Bottle-Maker's Cataract.

Dr. Robert Von der Heydt reported the case of a baker who, after years of exposure to the heat of the oven, developed what has been described in the literature as bottlemaker's cataract.

Discussion.—Dr. H. S. Gradle said that Birch-Hirschfeld had come to the conclusion that bottle-maker's cataract was caused by the ultra-violet rays and that heat had nothing at all to do with it.

Dr. Von der Heydt called attention to the fact that Birch-Hirschfeld's experiments were conducted on rabbits and that heat was eliminated. The eyes were exposed to light only. The cataract was developed in one minute. In bottle-maker's cataract the eye is exposed to heat for many years; Parsons' patient was exposed for twenty-four years. Other experimenters have produced retinitis and conjunctivitis by irritation, but in these cases light had nothing to do with it.

Transplantation of Skin for Pterygium.

Dr. Clark W. Hawley presented a case illustrating the transplantation of a piece of skin on the eyeball to prevent the return of a pterygium. The pterygium is first dissected from the cornea, being careful to stop where the conjunctiva and the cornea unite. Then, by slightly undermining the pterygium, it will recede, leaving the sclera exposed. From behind the ear a very thin piece of skin is shaved off and trimmed while on the razor to the desired size. This piece of skin must be just as thin as it is possible to cut it, otherwise there will be trouble afterwards. The piece is then floated from the razor directly upon the uncovered sclera. Then two stitches are passed through at each posterior cornu of the graft, upwards and backwards, anchoring it to the conjunctiva so that the pterygium cannot push it forward on to the uncovered corneal wound. This is the most difficult part of the operation, but so far has been necessary, but I believe I have solved the problem in another way, which will eliminate these two stitches, which will make the operation exceedingly easy, whereas now it is rather difficult. In time the graft disappears, the cornea has time to regenerate itself and become absolutely transparent.

Divergent Strabismus Cured by Tendon Tucking.

Dr. H. W. Woodruff, Joliet, reported the case history of a man, 28 years old, who had a divergent strabismus of 65 degrees which was cured by tucking of both internal recti muscles with tenotomies of both external recti muscles. Before operation the left eye showed a divergence of 65 degrees. After operation there was only 15 degrees of divergence, but the patient was annoyed by diplopia. Tucking of the right internus and tenotomy of the right externus resulted in binocular single vision with some exophoria.

Discussion.—Dr. Clark W. Hawley has done a simple tenotomy of the external rectus which secured binocular vision. The patient had had divergent strabismus as long as she could remember. With a little care he obtained fusion as well.

Dr. W. H. Wilder asked how much folding had to be done to get such a good result, and whether he had to go back of the muscle fibers themselves to secure enough of a fold.

Dr. Woodruff (closing) said that he had been doing this operation for about eight years, but he cannot tell accurately just the degree of result he can obtain. In the case reported he went back as far as he could on the external rectus because of the extreme degree of divergence, but he could not state the number of millimeters. He used the Worth suture except that he did not include the conjunctiva or capsule. That is the particularly commendable feature of the Worth operation. There is no slipping up on the fibers.

Dr. W. A. Fisher asked whether it would not be a good plan to insert the stitches as far back as possible and then not pull up so hard on them?

Dr. Woodruff, in a moderate degree of strabismus, would do the tucking first and then the tenotomy, partial or complete, as might be indicated, in convergent strabismus a slight under effect and in divergent strabismus a slight over effect. He regulates this by the tenotomy on the opposing muscle.

Some Observations on the Use of the Tonometer.

Dr. Walter Parker, Ann Arbor, Michigan, read a paper on the above subject.

Discussion.—Dr. E. V. L. Brown has been using the Schiötz instrument for several years and would be lost without it. He has found a number of tensions in the neighborhood of one hundred and one tension as low as five. The highest normal tension was twenty-seven; the lowest twelve. He called attention to an article by Schirmer on the use of the tonometer in iridocyclitis, in which he states that low tension is a constant symptom of this disease. Even after the disappearance of all symptoms the tension will often remain low for as long a period as a month. He recently had a case of papular syphilide with iritis in which the question arose as to whether the ciliary body was involved. The tension in this eye was five, and is still low, although the patient has excellent vision. It is a case of recurring iridocyclitis.

Dr. H. S. Gradle said that in the instrument devised by his father the stylet does not fall out, which is an essential objection to the Schiötz instrument. It necessitates sterilization of the stylet, and often the plating is damaged so that the stylet is roughened and may cause an injury of the cornea. The relationship between tension and blood pressure, he said, is worked out by Kramer. He examined the blood pressure in all his eye cases and found that in every case it was low when the tension was high.

Dr. M. N. Black, Milwaukee, asked whether the objection to the instruments stated by Dr. Parker, abrading the cornea, could not be overcome by applying cocaine solution or an oily collyrium to the eye?

Dr. W. H. Wilder said that a well standardized and convenient tonometer would be a very valuable aid in this work. The Schiötz instrument seems to be more accurate than any other. There are many problems that might be taken up in connection with this. For instance, the effect on the eye with increased tension; whether we could quickly decrease the tension by means of massage, which is frequently employed successfully in cases of acute glaucoma. He thought that such an instrument as a tonometer would amply repay one for time and money spent if it will accurately and quickly determine the degree of tension, more so than can be done by the simple method of estimating tension with the tactile sense. There is so much difference of opinion in the degree of tension observed. Weeks, of New York, claims to detect with the finger a three-fourths of one tension. He thought it required much experience to become expert in taking the tension of an eye. He feared that when this mechanical means became perfected there would be a neglect to develop the tactile sense for determining tension of the eye.

Dr. Parker said that a single application of cocaine for a minute would enable one to make an examination without any difficulty. When there is much spasm of the orbicularis he would not persist in the use of the instrument. He thought, however, that free use should be made of any mechanical apparatus which would enable one to do better work.

Dr. Wilder inquired whether Dr. Parker had observed any increase in tension following the instillation of cocaine. It has been stated, he said, that it is dangerous to use cocaine in eyes that have a tendency to glaucoma.

Dr. Parker (closing) has not had any experience in this direction. He has noticed a difference in the tension of the eyeball after the tonometer has been used for some time, but he has not had any experience with the instrument after the use of drugs.

A Simple Operation for Cataract. An Illustrated Report of the Operation as Performed at the Jullundur Clinic.

Dr. Derrick T. Vail, Cincinnati (by invitation), presented his paper, which was a descriptive and illustrated article of eighty-one pages, written during a visit to Smith's Clinic at Jullundur, Punjab, India, in September, October and November, 1909. The article was in book form in the nature of a special souvenir edition, a copy of which was presented to each member present. He said Smith uses no instruments of precision in diagnosing all kinds of new cases which come to his clinic for operation. He relies solely on the senses of sight and touch, acting on the principle that there is no disease of the eye which does not express itself objectively, and that a keen, accurate and well-informed surgeon can diagnose operable cataracts by his unaided senses.

Post-operative infection among over a thousand cases was so rarely present (two cases) that Vail could only attribute its rare occurrence to Smith's manner of preparing the field for operation. The "Jullundur speculum" is introduced and the lids held forcibly away from the ball, at the same time the brow and tissues of the orbit above the eye are forcibly retracted by the fingers of the unoccupied hand, thus exposing the entire conjunctival sac for douching with 1-2000 bichloride solution, which is sent in the conjunctival sac with gravity force in a half-inch stream.

The incision is purely corneal, being begun in the exact horizontal meridian at the limbus. The edge of the knife is held at an agle of 20° to 30° in relation to the plane of the iris. In one-third of the cases the cut is made with one forward sweep of the knife; in two-thirds of the cases completed with a return stroke, cutting as nearly vertically to the corneal layer as possible, and coming out two or three millimeters below the upper limbus. The iridectomy is done by pressing the iris up in the incision by external manipulation with the lower blade of the iris forceps and it is cut with ordinary iris scissors. A small iridectomy is always attempted.

The assistant now holds the upper lid away from the ball on Smith's lid hook held in the first finger and thumb of his right hand. With the extended fingers of the same hand the eyebrow is forcibly retracted to guard against the patient squeezing his eye. The lower lid is held with the flexed thumb of his left hand.

The operator now expresses the lens, using the bulbous end of Smith's lens hook applied to one spot midway between the lower margin of the pupil and the lower periphery of the iris, making deep pressure back toward the optic nerve and shifting the pressure as indicated by the behavior of the lens. In about one-fourth of the cases the lens turns within the eye and the lower edge ascends to come out of the incision first. This is favored by the operator making traction with his hook away from the incision or toward the patient's feet. As soon as the lens is about to escape through the incision, gentle upward manipulation is used to tuck the cornea behind it and the lens is then gently raked out of the wound by means of the hollow of the hook.

In two-thirds of the cases the lens starts to come upright. The operator will favor its upright delivery by following it up and at the same time tucking the cornea behind it. The iris is replaced at once by the iris repositor, the end of which is made to glide under the scleral shelf of the wound between the cut apron of iris and the cornea. The whole operation is usually done in less than five minutes' time. There is a minimum of traumatism and instrumentation.

The results in Jullundur were surprisingly beautiful and uniform, after-complications being the great exception.

Dr. Vail devoted his time while there to learning every minute detail of Smith's technique and he offered no improvements, modifications or suggestions, taking it for granted that the profession desired to know exactly how Smith operates in his own clinic.

Dr. D. W. Greene, Dayton, Ohio, complimented Dr. Vail on his paper and particularly on the illustrations he had made. He knew that this book had been delayed about three years because Lieut. Col. Smith did not have a man competent to illustrate his operation until Dr. Vail arrived. Smith has frequently described the operation, but could not get it illustrated, therefore, it has been imperfectly understood. In relation to the Jullundur speculum, Dr. Greene does not know who devised it. Smith does not claim it: they were made for us by a native in the Bazaar and with the two hooks and spatula made of *coin silver* cost about $2.50 in India. The set costs $10.00 in this country. As to the douche with which the eye is flushed, reference to Colonel Herbert's book on "Cataract Extraction" will show that he speaks very favorably of the value of bichloride in 1-2000 solution as an antiseptic. In India 75 per cent. of the people have trachoma, so that when the eye is flushed with this solution, germ growth is inhibited long enough for the section to heal. If it heals promptly, there is no infection.

In about 1200 operations, during our visit at Jullundur there were only four cases of infection. I have never equaled this record and I doubt whether it has been equaled in America. In Moorfields Hospital, in London, I have been informed by one of our members this evening, that there were three cases of infection in one hundred operations while there.

Dr. Vail, he said, spoke of Major Smith's stepping to the left side of the patient when he operates on the left eye; he does that because he believes in giving the patient the benefit of his best hand. Smith says no matter how ambidextrous a man may be, he is not equally skillful with each hand. There is no section in the world to compare with the Jullundur section, for the intra-capsular delivery in persons under sixty-five years of age. But being a corneal section he thought that in the case of patients seventy years old and over it is better to make the enlarged circular marginal section of de Wecker. The advantage of that section is that it is nearer the vascular circulation of the limbus, although it is not so well located for delivering the lens as is the Jullundur corneal section.

One thing not mentioned by Dr. Vail, he said, is this:

Major Smith picks up the eye with a special forceps. It is broad and has three teeth on one blade and four on the other. With this he takes a firm hold of the eye close to the sclero-corneal margin below and pulls the eye, if deeply set, right out of the socket. That deepens the anterior chamber, and permits of passing the knife through easily without causing any leakage of the aqueous or permitting the iris to fall over the knife. Of course, Major Smith is an expert at making this section. Out of perhaps three hundred sections seen by Dr. Greene, there was only one bad one, and that in a case of contracted fornix caused by trachoma. Of course, these Indians are not as old as they look; a man of forty will have the appearance of a man of eighty. The Jullundur incision, he said, is best suited for younger persons. It is better for those under sixty than for those over sixty. Of course, he said, the operation is new, and few men are capable of criticizing it, because only a few have seen it done, and learned it first hand. It is not the only cataract operation, but it is a good one for incipient and immature cataracts, and will always have a place among cataract operations.

The tendency of the operation is to make the pupil higher and broader than is desirable from a cosmetic point of view. I believe there are three causes for this tendency to high pupils:

1. The natural tendency of the uncut portion of the iris to contract centripetally and draw upward.

2. A certain amount of paresis of the muscles of the iris from pressure on its lower third in delivery.

3. Loss of vitreous always causes a high and broad pupil.

Discussion.—Dr. Wilder inquired where Major Smith gets his knives.

Dr. Vail said that they are made by Weis, of London. Major Smith prefers a knife that has been sharpened and re-sharpened until it is pronounced dangerous by the maker. The knife is then merely a steel sliver. It is a very short-bladed knife and very thin. It would easily be broken if used as we use our knives in cataract operations. By holding it very lightly Smith makes a sweeping incision, going in and coming right out.

WILLIS O. NANCE, *Secretary*.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of November 19, 1910, in Denver. Dr. W. C. Bane, presiding.

Corneal Injuries from Blasting.

Dr. C. E. Walker showed a man whose corneæ had been peppered by particles of rock, while blasting, eighteen months before. In the right eye an artificial pupil was made opposite a fairly clear portion of the cornea, one year later; the lens being clear, apparently, but the globe was now soft. A staphyloma of the left cornea had developed. This was opened, and through the incision a cataractous lens was removed.

In Dr. Walker's second case the explosion had occurred nine months previous. One eye was a shrunken stump; the other presented a peppered cornea, dense leucoma below and anterior synechia.

Discussion.—Dr. Jackson said that the cornea was surprisingly tolerant to injury, remaining clear between the injured spots. In Dr. Walker's second case he would do an optical iridectomy.

Dr. Spencer thought there was probably a retinal detachment in this case, and that vision would thereby be lessened, if the iridectomy proved successful.

Dr. Patterson also questioned the benefit of iridectomy; but Drs. Bane, Hilliard, Conant and Libby advocated the operation.

Ptosis.

Dr. Jackson presented a case of congenital bilateral ptosis in a young man operated on six years before by Motais' method, isolating the midle third of the tendon of the superior rectus and attaching it to the tarsus. The operation was done on both eyes at the same time. In addition to gaining control over the lids, which remained as good as shortly after the operation, the patient had quite lost the wrinkling of the brow and the habit of keeping the head thrown back, which alone had enabled him to see prior to the operation. Dr. Jackson also reported a case of bilateral ptosis due to progressive ophthalmoplegia externa, which had been increasing for twenty years. The eyes retained some power of movement outward and downward; there was good mobility of the pupils, and fair accommodation for the patient's age, 42 years.

Discussion.—In answer to questions by various members, Dr. Jackson stated that he did not overcorrect the deformity at the time of operation, that the silk sutures were passed through the central portion of the tarsal cartilage and were not disturbed until cut, that the eye was dressed daily, and that the correction of the ptosis was established at the end of three months.

Detachment of the Retina.

Dr. Libby presented a man of thirty-eight, who had first consulted him six months before on account of monocular blindness of sudden onset and four months' duration. A segment of the retina representing the lower quadrant, but not extending over three disk diameters from the nerve head, was completely detached. The apex of the detachment overlapped half of the optic disk. There were moderate vitreous opacities. The anterior segment of the globe was normal, as was the fellow eye. The general health was good, and syphilis was excluded. The refraction was low hyperopia. Subretinal growth was excluded. Iodide of potassium was given in increasing doses, saline cathartics, pilocarpin sweats, and Turkish baths, but the condition had remained unchanged for the three months of treatment, and the three months following. Operative interference was declined, first and last. The provisional prognosis made at the first examination was confirmed by the end result of this unfortunate case, which for want of a better designation must be classed as idiopathic retinal detachment.

Discussion.—Dr. Sisson stated that statistics showed the results of surgical as compared with medical treatment of detachment of the retina were about equal.

Dr. Friedmann suggested decompression.

Cataract with Optic Atrophy.

Dr. A. C. H. Friedmann reported vision 5/5 after cataract extraction and subsequent discission in one eye. Five months later he removed a mature cataract from the other eye; after which he found optic atrophy of that eye.

Posterior Polar Cataract.

Dr. F. R. Spencer reported a woman of twenty-four whose vision, refractive media and fundus oculi had been found normal five years before, but now vision was 15/20 with correction of 1.50 D. compound hyperopic astigmatism, and there was much accommodative asthenopia, with severe headache. Each lens showed posterior stellate polar cataract. The kidneys and blood pressure were normal. The patient was taking complete rest from her work as a stenographer, and was under the general care of her family physician.

Discussion.—Dr. Ringle advocated a radical change in her manner of living. Drs. Bane, Walker and Patterson spoke on this same line.

Dr. Libby suggested, in addition, dionin locally, iodides and eliminants internally.

Lid Edema.

Dr. W. A. Sedwick reported a young woman whose lids swelled intermittently, accompanied by redness of the globes. Sinus involvement had not been found by two observers.

Discussion.—Dr. Spencer suggested angioneurotic edema. Dr. Bane remarked that we all see cases in which we cannot find the cause.

Significance of Subconjunctival Hemorrhage.

Dr. Spencer read the following note: "Those of you who were at the meeting of this society in Dr. Black's office last year will remember the discussion concerning the significance of subconjunctival hemorrhage. The consensus of opinion was that it is often one of the early symptoms of high arterial tension. Shortly after the meeting I found the following in Haab's text book on "External Diseases of the Eye," page 145: It has been observed especially in persons who are subjects of marked arteriosclerosis, with or without nephritis, and who usually die of apoplexy; hence the phenomenon is significant from a diagnostic point of view.'"

Discussion.—Dr. Libby thought it best always to give the patient or his physician some warning as to the prognosis in cases of nontraumatic subconjunctival hemorrhages, especially if recurring, and to suggest taking the blood pressure and making urinalyses.

Dr. Ringle considered that high pressure with subconjunctival ecchymosis foreboded evil, and mentioned a case in point.

Meeting of December 17, 1910, in Denver. Dr. D. H. Coover, presiding.

Retrobulbar Neuritis.

Dr. Coover showed a rather stout girl, aged 10 years, who had recently noticed sudden loss of vision in the left eye. The previous history was indefinite and the etiology obscure. Sinus involvement was not found, but the posterior ethmoidal cells and the sphenoidal sinus were suspected. The specific gravity of the urine was 1008, and albumin, sugar and indican were excluded. Peripheral perception of light was admitted one day, but denied the next. The other eye was normal. The case was shown because of its indefiniteness, and to ask an expression of opinion as to causation and treatment.

Discussion.—Dr. Walker thought these cases very obstinate, and had found internal medication and local treatment by electricity of no benefit. He would consider deep orbital injections of salt solution or mercury.

Dr. Neeper had seen two similar cases cured under the use of K. I. and the high frequency current.

Dr. Jackson suggested the possibility of a hypophyseal growth.

Dr. Patterson had noticed dry crusts in the left nostril, and thought there was a probable involvement of the posterior ethmoidal cells or the sphenoidal sinus. In this, as in every case of unilateral optic neuritis, he would remove the anterior end of the middle turbinal and examine the ethmoidal cells. There might be a walled off cell.

Dr. Davis mentioned Bernheimer's practice of emptying the posterior ethmoidal cells in unilateral optic neuritis, if poison could be excluded, and noticed that most of the cases so examined showed mucocele.

Dr. Black considered the prognosis good if ethmoidal trouble was found and relieved; otherwise the prospect was poor.

Dr. Crisp suggested shrinking the nasal mucous membrane in the hope that the sinuses would then drain freely.

Dr. F. C. Todd considered suction an aid, and thought that the finding of pus would clear up the etiology. He thought the crusts in the left nostril suggested pus in the cells, and he would remove the middle turbinate, believing that operation justified in cases of impaired vision of obscure origin.

The consensus of opinion was that the case was one of retrobulbar neuritis, possibly of toxic origin, but probably due to ethmoiditis.

Cyst of Iris.

Dr. C. E. Walker presented a woman of about seventy, from whose right eye he had removed a cataract twelve years before. At the same time he excised a serous cyst of the upper quadrant of the iris. The vision after extraction was 20/20. Five years later another serous cyst of the iris developed, to the nasal side of and just below the other. It had grown slowly and was about 2 mm. in diameter and of a pearly white appearance. The other eye showed a senile cataract.

Discussion.—Drs. Hess and Coover had each seen a similar condition, of slow growth, while the patients were under their observation, but there was no operation.

Cysts of Bulbar Conjunctiva.

Dr. Coover also presented an adult who, the day before, had shown five round cysts of the conjunctiva, 1 to 5 mm. in diameter, situated over the attachment of the external rectus and well forward toward the corneal limbus. The cysts were now scarcely visible.

Discussion.—Dr. Bane had removed single cysts of the conjunctiva, in adults, by incision.

Dr. Black had encountered a conjunctival cyst, 2x5 mm., on the nasal side. It would empty itself and refill, intermittently. Incision was followed by obliteration.

Dr. Walker had seen several cysts cured spontaneously.

Dr. Friedmann considered these cysts trophoneurotic, and had often noted them in adult Russian Jews.

Dr. Libby mentioned the obliteration of a small cyst of the outer fourth of the palpebral conjunctiva of the lower lid, by incision and application of nitric acid.

Dr. Sisson believed these cysts to be caused by a perverted flow of imph.

Dr. Strickler had observed obliteration following incision.

Localized Arteriosclerosis in Orbital Apex.

Dr. Frank C. Todd, of Minneapolis, reported a unique case of great extravasation following the severing of the optic nerve and its vessels in enucleating the blind eye of a young adult. Two years before, blindness of that eye had occurred from thrombosis of the central vein. The central vessels, subsequent to the enucleation, showed calcareous degeneration.

Spasmodic Miosis.

Dr. Neeper reported two cases of failure to get mydriasis from atropin in phlyctenular conditions with photophobia. In one case both eyes were affected, while in the other the condition was monocular.

Discussion.—Dr. Black thought the failure due to washing out of the atropin by the excess of tears and to spasm of the sphincter of the iris.

Drs. Friedmann and Coover advocated holding the lids open, closing the puncta and applying powdered atropin.

Steel in the Orbit.

Dr. Black reported an injury to the eye of a man using a sledge and steel cutter. The following day there was found a penetrating wound of the lid, intense conjunctival chemosis, dilated pupil (atropin had been used), absence of fundus reflex and blindness. By means of X-ray plates Dr. G. H. Stover located the foreign body three-fourths of an inch posterior to the globe, and toward the nasal wall of the orbit, and judged it to be ½x½x3/16 of an inch in size. The use of the magnet was unsuccessful. Dr. Black believed that a piece of steel had passed through the eye and lodged in the orbit, and that unless infection should occur around it, the eyeball would probably be saved. Therefore, he counselled delay.

Discussion.—Dr. Ringle had extracted with a magnet, through the wound of entrance, a large piece of steel that had passed through the globe and into the apex of the orbit.

Meeting of January 21, 1911, in Colorado Springs, Dr. A. C. H. Friedmann, presiding.

Blasting Injuries.

Dr. Melville Black presented a man whose eyes had been severely injured by the explosion of a misplaced charge, in a copper mine. The right eye had quantitative vision through a white exudate back of the coloboma made comparatively soon after the accident by an optical iridectomy. The anterior chamber was narrow, the iris atrophic and the globe tender. The left eye was blind and showed plus tension. Dr. Black raised the question of operative procedure on the right eye.

Discussion.—Dr. Jackson thought that the great liability of closure of the pupil when iridectomy was done rather soon after severe traumatism to the eye, indicated considerable delay in operating. In Dr. Black's case, as in others of this class, he would not operate before two or three years after the injury.

Multiple Corneal Ulcers.

Dr. E. R. Neeper showed a young man with a history of epiphora of several years' standing, who, in the week before, had developed one large and eleven small superficial ulcers of the cornea of one eye, following influenza. Iodized phenol was of no apparent benefit, but applications of nitric acid were effective. Protonuclein had been dusted in once that day. The globe was still very red and the eye painful, but the corneal epithelium took scarcely any stain from fluorescin.

Discussion.—Dr. Bane suggested one per cent. soda cinnamate injections, subconjunctivally.

Dr. Black had found 25 per cent. argyrol, instilled every hour, very beneficial in corneal ulcers. He considered that there was a profound trophic disturbance in the case exhibited.

Bullous Keratitis.

Dr. Neeper also showed a woman of sixty-six, whom he had first seen January 12, 1910. The left eye had been painful most of the time for the previous six months. Family and personal history good excepting "sick headaches" nearly every month all her life, and chills for seven years during childhood. She had lived in Tennessee, Missouri and Kentucky until she came to Colorado in 1906. Since then sick headaches had been much less frequent, but nocturnal headaches became very persistent until an osteopath treated her in November, 1910. When first seen the lower half of the left cornea took a moderate, rather uniform stain, the surface being irregular with a facet 2 mm. in diameter midway between the center of the cornea and the limbus. The patient had been seen with great frequency during the past year, and scarcely a day had passed without the development of one or more bullæ on the lower half of the left cornea. Since February, 1910, an occasional bulla had formed on the same portion of the right cornea. Treatment internally had covered a great scope, viz.: Eliminants of all sorts, quinine, mixed treatment, tonics, electricity, etc., etc. Locally, antiseptics, astringents, miotics, sedatives, bandaging after using ointments, etc., etc. No treatment had helped greatly, although several had promised much at first.

Discussion.—Dr. Patterson said that iridectomy suited some of these cases, and would advise it in the right eye.

Unusual Case of Squint.

Dr. Neeper presented a woman, aged twenty-four, who came for glasses for headache and asthenopia, January 3, 1911. Monocular vision at all distances. The right globe turned up and out to axis about 120° when fixing intently in the distance. Vision = 20/30 + each eye. Under homotropin a + .50 D. sph. ○ + .50 D. cyl. axis 90° was given, which slightly improved vision. With this correction, January 20th, there was binocular vision at the near point, but the condition as to distance was unaltered. Under homotropin there was orthophoria at all distances. The glasses benefited the asthenopia.

Discussion.—Dr. Patterson had used the stereoscope successfully in upward and outward squint.

Traumatic Optic Atrophy.

Dr. Neeper also presented a man who was caught in a mill belt on September 9, 1910, and badly injured about the head and upper part of the body. He was first seen eight days later, with both eyes "black," lacerated wound of the angle of the right jaw and much soreness in the right supraorbital and temporal regions. The right eye was blind, the pupil responding to consensual stimulation, and dilating fully when the left eye was covered. The right also diverged considerably. The patient's mentality was poor, but he thought the right eye had been blind ever since the accident. The media had been clear at all times, and the fundus normal except dilated and tortuous veins. K. I. was given. High frequency current was begun October 23rd.

October 1st, R. V. = fingers at a half meter in the upper nasal field. October 5, right disk showed pallor. Strychnia to saturation was added to the medication. October 24, pallor increasing. The high frequency was discontinued and intermittent X-ray begun. December 16, R. V. = 5/200 and the disk to the nasal side was of better color. January 20, 1911, R. V. = 9/200. Disk not as good color as a month before.

Discussion.—Dr. Black thought the injury must have occurred at the optic foramen, the nerve being pinched, but some few fibers escaping damage.

Dr. Jackson thought there had probably been a hemorrhage into the nerve sheath, and that absorption had gone on far enough to restore some vision. Optic atrophy was very evident.

Congenital Miosis.

Dr. A. C. Magruder presented a child of six years, with the history of squint and contraction of the right pupil from birth. R. V. = 2/200, not improved by any lens. L. V. = 20/30, with 3 D. of hyperopia. Atropin failed to dilate the right pupil, but dilated the left widely. There was slight rotary nystagmus and paralysis of the internal, inferior and superior rectus muscles. The case was shown in the hope of determininig the etiology.

Discussion.—Dr. Jackson stated that he considered the case one of congenital absence of certain movements, due either to defective centers or possibly to absence of the muscles. He had seen congenital divergence, with retraction movements.

Dr. Libby called attention to the facial expression as indicative of impaired mental development.

Suppurating Corneal Ulcer; Vaccine Treatment.

Dr. Magruder also showed a coal miner, aged sixty-two, first seen December 27th, with a history of having been struck by a piece of coal on the outside of the upper left lid eight days previously. He had no pain until twelve hours later, and did not apply for medical treatment for eight days, at which time there was a large ulcer of the cornea, which extended to Descemet's membrane. There was a distinct iridocyclitis with synechia which atropin failed to break up.

The eye and surrounding parts were thoroughly cleansed with bichloride solution, and carbolic acid, followed by alcohol, was used on the ulcer. Atropin and hot compresses were ordered. Staphylococcus infection was found, so a vaccine containing twenty million staphylococci was administered, but without effect. On January 2nd, hypopyon existed. The ulcer was cauterized, the anterior chamber being entered. Dionin powder was applied to the ulcer previous to the use of the cautery. The cautery was used three times. The eye was washed from time to time and atropin and dionin used. On January 18th 1 cc. of 2 per cent iod. chlor. sol. was injected subconjunctivally. On January 20th, ¾ cc. of the following was injected: Mercury cyanide. .01; sod. chlor., 1.00, and distilled water 50.00. This was very painful, but the patient reported on the following day that he had been freer from pain than at any time since the accident. The hypopyon had entirely disappeared and the eye looked very much better than for several days. Alcohol compresses were used as an external dressing.

Discussion.—Dr. Black had found cyanid of mercury injections very effective in corneal ulcers, and thought that lacrimal disease was nearly always associated with severe keratitis.

Drs. Marbourg and Coover had found coal very infective, in corneal injuries.

Dr. Bane considered the germs of the lacrimal sac a serious menace in abrasions of the cornea, and had found coal very infective.

Dr. Neeper had found normal salt solution more desirable than cyanid of mercury for deep injections.

Dr. Patterson thought personal filth was the worst feature encountered in corneal infections.

Dr. Friedmann believed the severe laceration caused by coal was a factor in infection. He placed copper first and coal second, in infection, and advocated the cautery and normal salt injections in infected corneal ulcers.

Probable Rupture of Optic Nerve Sheath.

Dr. A. C. H. Friedmann presented a boy of thirteen years, with a history of having been struck over the right eye by a rock, about two years before. No change in the appearance

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of this eye was noticed at the time, but about a year later advice was sought on account of convergent squint. R. V. = fingers at 5 metres, L. V. = 5/4 with + 0.50 cyl. ax. 90°. Ophthalmoscopically, the nasal margin of the disk was best seen with —3.00 spherical, while the temporal margin was rendered distinct with —10.00 spherical; giving an oblique appearance to the nerve head, which was also unduly white.

Discussion.—Dr. Jackson said that if this eye were known to have been normal before the accident, he would say that there had been a tearing loose of the optic nerve sheath by the injury. Otherwise he would consider the defect congenital. He thought the case most interesting ophthalmoscopically.

Dr. Hosmer considered that the lack of pigmentation of the conus argued in favor of congenital defect.

Dr. Bane and others present had never observed this condition.

Abducens Paralysis from Meningitis.

Dr. Friedmann also showed a patient of eleven years who had suffered from convulsions when fifteen months old, a "lame foot" resulting. Spinal meningitis had been diagnosed by Dr. G. E. Newhaus. Talipes equinus, horizontal nystagmus and paralysis of the external rectus developed. It was stated that the child had never seen well. R. V. = 5/25 with + 0.50 sph. ⊃ + 0.75 cyl. ax. 90°. L. V. = fingers at 5 metres.

Toxemia of Pregnancy.

Dr. J. J. Pattee reported a primipara of thirty-eight who had been married nine months, and now had a child nine days old. A month before she had been sent to a hospital, on the discovery of 30 per cent. of albumin in the urine. There was no headache, convulsions or coma. Under treatment the albumin was reduced to 17 per cent., but when it rose to 20 per cent., the woman was delivered by aid of forceps and under general anesthesia. After this the first impairment of sight was noticed in inability to read. R. V. = fingers at 8 feet. L. V. = fingers at 10 feet. The ophthalmoscope showed 8 or 9 distinct spots of yellowish red retinal exudate about half the size of the disk. Dr. Pattee desired an expression of opinion as to the prospects for vision.

Discussion.—Dr. Jackson said that there was a strong probability of useful vision, and that the exudates generally cleared up entirely or nearly so.

Dr. Patterson asked if the toxemia was not the cause of the poor vision.

Drs. Black and Libby thought the prognosis good.

Dr. Coover mentioned a primipara at 7½ months with hemorrhagic retinitis, and vision reduced to 6/60. Premature labor was induced. Normal vision was restored. He also recalled two other similar cases.

Dr. Marbourg related a case with albuminuric retinitis in two pregnancies, with good end results.

Dr. Libby reported a woman 6½ months pregnant, aged 43, who had once aborted, and was of the myxedematous type. She complained of dimness of vision for the previous two weeks, being barely able to recognize faces. There had been no former ocular disturbance. There was no headache or eclampsia. The urinary excretion was but 13 ounces in 24 hours, with one-fourth the normal urinary solids, and very abundant albumin. The ophthalmoscope showed marked double hemorrhagic neuroretinitis. Five weeks after the prompt induction of premature labor, vision and accommodation had returned to normal. Two months later every trace of retinal exudate had disappeared.

Wolffberg's Test.

Dr. Jackson demonstrated Wolffberg's test for ametropia, pointing out that the round solid circle was superior to the incomplete ring in cases of astigmatism.

"606."

Dr. Coover reported the successful use of "606" in two cases. In the first case there had been six attacks of recurrent iritis. Iridectomy had been done in the right eye 20 years before. The left eye showed posterior synechia. The Wasserman reaction was positive. A severe iritis was cleared up by "606," and vision greatly improved. In the other case there was neuroretinitis, with hyalitis. At first R. V. = 6/20, L. V. = 6/12. Vision finally fell to light perception in each eye in spite of the use of cacodylate of soda, mercury and iodides. Three Wasserman tests were made before a positive reaction

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was given. Then, following one administration of "606," vision rose in about a month to R. = 6/15; L. = 6/7.

Dynamite Cap in the Capsule.

Dr. E. M. Marbourg reported an old case of injury of a boy's eye by an exploding dynamite cap. The lens had absorbed, leaving the foreign body, 2x4 mm. in size, embedded in the posterior capsule. Operation was refused by the parents. The other eye had been lost from sympathetic ophthalmitis.

George F. Libby, *Secretary.*

TRANSACTIONS OF THE OPHTHALMOLOGICAL SOCIETY OF THE NETHERLANDS—THIRTY-FIFTH ANNUAL MEETING.

By D. A. Kuyk, M. D.,

RICHMOND, VA.

The Mercurial Treatment of Ocular Diseases.

Dr. Piekema, President, delivered the annual oration upon, "The Mercurial Treatment of Ocular Diseases." He advocated the injection and inunction methods. The former when immediate effect is imperative, then, when the process is controlled, the treatment with inunctions. The efficacy of the subconjunctival injection was emphasized.

Discussion.—Dr. Straub does not employ the mercurial preparations as frequently as in past years, but only in well defined cases of syphilis. He finds that the alternate use of injections and inunctions will control the most obstinate cases that will not yield to either method when used alone. Rest for the eyes is a most potent agent for good in eye diseases. In many cases tuberculin is indicated rather than the mercurials. The method of von Hippel is employed; he uses T. R. once a week, in some cases every fourteen days, but in smaller doses than usually advocated, the repetition of the dose depending upon the effect and reaction from the injection. In no case is it repeated until there is complete recovery from the former injection. He has used the tubercle bacilli emulsion, a mixture of the old and new T. R., as advocated by von Hippel. This agent is better tolerated and is cheaper. The results from its use have been all that could be desired.

Dr. Piekema asked if these tuberculin injections were used in ambulatory cases. Also, if Dr. Straub is convinced that no injury occurs to these patients, although it may be years before it manifests itself.

Dr. Straub replied, in view of the fact of possible injury he does not advise the use of tuberculin injections in ambulatory cases, but, since rest is so valuable an agent in any healing process, he insists upon giving the diseased organ complete rest.

Dr. Piekema asked the speaker concerning Darier's subconjunctival injections.

Dr. Straub replied that Darier is an enthusiast upon the subject, but that the use of normal salt solution has given him results equally as good as when the sublimate solution has been used.

Dr. Nicolai has seen sublimate injections produce immediate results when salt solution has entirely failed.

The Cure of Entropion by Extirpation of the Tarsus.

Dr. Straub stated that in former papers he had endeavored to demonstrate the malformations of the upper eyelid following trachoma. Following trachomatous inflammation, the affected spots of tarsal conjunctiva is transformed into scar tissue, contraction ensues, which, progressing causes a shortening and thickening of the tarsus. A forward displacement of the fornix occurs upon the tarsus and a contraction of the lid border downward, inward and backward, curling upon itself. The posterior portion of the lid, not the tarsus, becomes elevated, the concave surface towards the ball; the lid tissue adjacent to the scar tissue becomes stretched. This causes eversion of the tarsal glands and some of the tissue, trichiasis, etc.

In his clinic an attempt has been made to determine the value of each of the numerous operations for entropion. It was concluded, after many trials, that the operation of Anagnostakis, often known as Hotz's operation, held out the greatest chance for permanent success. Since then, however, we have learned from Kuhnt that the tarsus may be extirpated without impairing the function of the lid. It is obvious, then, that this is the best method of correcting entropion. In a case of chronic enlargement of the tarsus there existed a well marked entropion. It became necessary to extirpate the entire tarsus and it was observed that the entropion was cured simultaneously with the healing of the lid wound. In a large number of cases of entropion the extirpation of the tarsus was followed by an immediate and permanent result. It was then concluded that only in mild cases of entropion was the operation of Anagnostakis indicated, but that all severe cases required the exirpation of the tarsus; firstly, because of direct benefit upon the entropion, and secondly, because it had a most beneficial effect upon the complications of trachoma. The effect is not so marked in the first few weeks following the operation, but afterwards it becomes quite noticeable. Further, it appears that extirpation has the effect of widening the palpebral orifice. Before the operation, the thickened conjunctiva and the contracted fornix narrow the palpebral orifice, consequently lessening the movement of the globe. After the operation these movements are more easily executed, hence the eye can be kept clean and clear bcause of the increased mobility of the eyeball. The objection to the operation is that of the unevenness of the conjunctiva the first few days following the operation, thus favoring the occurrence of a conjunctivitis or a keratitis superficialis. These complications were quite frequently observed in our first cases, but later on as our technique improved, especially the suturing, these accidents became much less frequent. The predisposition of the conjunctiva to these complications is especially great during the process of healing, but after that is complete the tendency is diminished.

Detachment of the Retina Occurring Three Years After the Injury.

Dr. J. R. Van Geuns reported the case history of a workman in copper who, on the 18th of July, 1906, received an injury in the right eye. Two hours afterwards he came for treatment. A piece of copper 1.5 cm. long, 1 cm. broad and 1.5 cm thick was removed. The sharp edge of the splinter entered the ball to the nasal side, just above the horizontal line, 4 to 5 mm. from the limbus, the splinter was directed diagonally upward and backward. Upon its removal an opening of about 5 mm. long was left. The chorioid protruded through the wound, there was but little bleeding, the wound did not seem dangerous or serious. The wound was closed with two sutures. On the 4th of August only a small scar remained.

V=I. In the chorioid there was also a small white scar over which the retinal vessels passed unobstructed. The vitreous was clear and quite normal. Three weeks afterwards the patient reported and the conditions were identical with that of the last examination. He was not seen again until April 6, 1909, when he reported that for fourteen days the vision had been failing. A small detachment of the retina was visible at the site of the chorioidal scar. Three weeks later the detachment was total. The point of interest was that although there was no injury to either retina or vitreous, yet as a result of the injury after a lapse of three years, during which time there was normal vision, complete detachment of the retina should have occurred.

Dr. Van Geuns reported a case of traumatic injury to the optic nerve by which it was completely torn in two without injury to the conjunctiva. On the 27th of July, 1907, a man came to the clinic two hours after a fall from his bicycle. He struck his eye against either the shaft of a wagon, under which he fell, or upon the handle bar of his wheel. The eyeball was luxated, there was intense swelling with suggillation of the lids and to a minor degree of the conjunctiva, which was to all appearances uninjured. It was necessary to enucleate the eye at once and though careful search was made, no injury of the conjunctiva could be found. It was found during the enucleation that the external rectus muscle and the optic nerve had been entirely torn away, but the other muscles, as well as the bulb, were intact. The case was so unusual that it was reported.

The Incapacity-Percentage Caused by the Loss of One Eye.

Dr. Van Geuns read an exhaustive paper on this subject. His conclusions were as follows:

1. The generally accepted incapacitation of 30 per cent. is too great.
2. Compensation for the loss of one eye, after much study and investigation, should be reduced by 5 or 10 per cent.

After a prolonged discussion, during which Prof. Straub pointed out that the nervous disturbances caused by frequent and prolonged examinations of these patients, arousing in them the fear of reduced compensation for their injury, played no unimportant part in the consideration for damages, it was decided to appoint a commission to fully investigate the whole subject and prepare a printed report to be sent to the members before the next meeting, so that a full and free discussion of the subject could be had and some definite conclusion reached upon this matter of compensation.

BOOK REVIEWS.

Treatment of Chronic Glaucoma.

(Traitement du glaucome chronique; sclerectoiridectomie et sclerectomie simple.) By Doctor J. Beauvieux, Bordeaux. 244 pages. Published by G. Steinheil, Paris. Price, 5 francs.

In this monograph, Beauvieux reviews the theories which have been proposed concerning chronic glaucoma, and states his own belief, which briefly is that the eye of a patient of a certain age, which is dystrophic and sclerosed, under some unknown influence of the nervous system, becomes the seat of a hypertension, induced by a chronic edema of the uveal tract and vitreous. This causes a blocking of the excretory paths, adding hypoexcretion to hypersecretion. The best remedy is the construction of a new permanent excretory path, though there are other forms of treatment. These consist of (A) non-operative: (1) correcting lenses, (2) miotics, (3) massage, (4) galvanic current, (5) internal medication; (B) surgical treatment, (a) extraocular operations, (1) extraction of the external nasal nerve (2) resection of the cervical sympathetic; (b) intraocular operations, (1) iridectomy, (2) sclerotomy, (3) incision of the iris angle, (4) iridodialysis, (5) sclerochoriotomy, (6) cyclodialysis, (7) sclero-cyclo-iridal puncture, (8) Hancock's operation, (9) posterior sclerotomy, (10) cystoid cicatrices by enclosure of the iris, (11) Bjerrum's operations, (12) sclerectomy and sclerectoiridectomy. The author discusses each method in detail and concludes that the non-operative are useful in the earliest stages or to carry the patient over the time before an operation can be done. All the operative forms have successes to their credit, but against all can be brought the charge that the relief is only temporary in some cases, and in others is wholly inadequate. The sclerectomy and sclerectoiridectomy of Lagrange is the only operation which fulfils all the indications. Several cases are reported and the operation described.

Clarence Loeb.

The Improvement of Ocular Protheses by Orbital Heteroplasty and the Pseudo-Plastic Operations.

(De l'amélioration de la prothése oculaire par l'hétéroplastie orbitaire et les opérations pseudo-plastiques.) By Dr. Georges Bonnefon, Bordeaux. Published by G. Steinheil, 2 Rue Casimir-Delavigne, Paris.

This monograph of 130 pages reviews the history of the attempts to improve the appearance of ocular protheses, and describes the method of grafting the eye of a rabbit into the orbit. The work is divided into three parts.

1. The pseudoplastic operations, or those whose purpose is to heal into the cavity of Tenon or the eviscerated sclera some foreign body, to produce a better stump.

2. The pseudo-grafting operations, or the methods which may be considered as a transition from 1 to 3.

3. Heteroplasty proper, or the grafting into the orbit of a stump of an organized, living substance, capable of forming vascular relations with its host and of participating in its physiologic life without degenerating or being absorbed.

1. This includes the operation of Mules and its modification, that of Frost-Lang, Gersuny and Eckstein. The author describes the methods, the indications and contraindications, and the results, and shows why these were so often failures.

2. This includes the attempts to heal into Tenon's capsule of sponges, carbon, etc. These were absorbed, leaving no better stump than by simple enucleation.

3. This includes all the steps from the original method of Chibret in 1885 to its modification and perfection of technic by Lagrange. The theory of the method is discussed, showing that it is a rational one, and several case histories are reported with photographs illustrating the position of the prothesis and its appearance, especially as contrasted with the normal eye. Clarence Loeb.

NEWS AND NOTES.

Dr. W. Norton Whitney, of Tokio, Japan, sends us the following interesting statistics relative to the prevalence of trachoma in Japan:

1. Dr. Y. Maduno, at Urawa, a coast town near Yokohama, among 5,837 persons examined in 1907, found trachoma in 37.02 per cent.

Occupation.	Trachoma.
Restaurant keeper	29.87%
Boarding-house keeper	27.27%
Barber	45.34%
Wine-shop keeper	60.91%
Prostitute houses	32.00%
Acupuncturist	66.65%
Hotels	46.51%
Bath houses	31.81%
Work shops	36.63%

2. Dr. J. Arisawa and Dr. S. Marno in 1908 found among 2,926 students in the Tokio Imperial University 6.9% of trachoma.

	Trachoma.	Per Cent.
The College of Law	1324	6.25
The College of Medicine	384	4.94
The College of Engineering	495	8.48
The College of Literature	389	7.19
The College of Philosophy	102	6.86
The College of Agriculture	232	9.95

3. The Department of State for War (1909)*.

Examination of new recruits, age about 19:

Prefecture.	Trachoma.	Per Cent.
Tokio	1389	62.94
Kyoto	878	92.69
Osaka	2005	127.73
Kanagawa	1517	155.93
Hyogo	4922	278.91
Nagasaki	2949	362.78
Nugata	3482	216.11
Saitama	1702	136.16
Gumma	2679	320.15
Chiba	5059	410.97

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*We presume that the percentages here represent the relation of those recruits examined with trachoma to those accepted into the army without trachoma.

Prefecture.	Trachoma.	Per Cent.
Ibaraki	3360	288.02
Tochigi	2412	272.08
Nara	1890	335.72
Mie	1285	139.43
Aichi	4189	269.23
Shizuoka	7802	139.43
Yamanashi	907	171.52
Shiga	606	94.14
Gifu	1518	165.45
Nagano	1444	116.51
Meiyagi	3223	351.93
Fukushima	5271	456.01
Iwate	1693	238.05
Aomori	2277	387.71
Yamagata	2187	261.67
Akita	1600	219.66
Fukui	1167	217.68
Ishikawa	768	121.19
Toyama	554	86.51
Tottori	588	150.15
Shimane	352	55.55
Okayama	3360	323.64
Hiroshima	2292	162.06
Yamaguchi	732	92.30
Wakayama	554	83.93
Tokushima	3324	510.51
Kagawa	2353	36.86
Ehime	2320	224.35
Kochi	1089	185.77
Fukuoka	6122	435.95
Oita	1809	244.38
Saga	2046	339.70
Kumamoto	3421	322.71
Miyazaki	1617	357.93
Kagoshima	2984	280.74
Okinawa	385	78.88
Hokkaido	3907	239.34
Taiwan	110	174.21
Karafuto	28	84.59
	104,540	222.04

Scholarship in Ophthalmology.

A scholarship in ophthalmology has been founded by William A. DuBois, Matthew B. DuBois and Katherine DuBois, sons and daughter of Dr. Abram DuBois, who have presented to the Columbia University the sum of $18,000, to be used as a fund for this purpose. This is to be known as "The Doctor Abram DuBois Memorial Fund." The scholarship is open to graduates of the College of Physicians and Surgeons, who have satisfactorily completed a term of service in an eye hospital and who have given evidence of serious intention of pursuing ophthalmology as a specialty. The holder of the scholarship is expected to devote himself to post-graduate studies, preferably of a scientific character, connected with ophthalmology in foreign and American universities. The income amounts to about seven hundred dollars ($700) a year.

The bestowal of this scholarship is in the hands of a committee consisting of the professor of ophthalmology, the dean of the medical school and Dr. Edward L. Partridge.

Ophthalmic Literature is the name of a new publication edited by Dr. Edward Jackson, of Denver, Colorado, assisted by Dr. William H. Crisp, the first number of which appeared in January. The chief purpose of the journal, as explained by the editor, is "to render the current literature of ophthalmology directly available to those engaged in ophthalmic practice. It is not intended to duplicate any Journal now published. But it is intended to make every such Journal more serviceable to its readers, and also to assist special students and those engaged in editorial work."

The general plan of the Journal will be to publish at the beginning of each month a classified topical index of ophthalmic publications that have come to hand during the preceding month from all parts of the world. The index will occupy the larger part of each issue.

We believe that *Ophthalmic Literature*, under the able editorship of Drs. Jackson and Crisp, will prove to be a very useful adjunct to the many journals through which the live ophthalmologist is compelled to flounder.

Dr. Wm. M. Sweet has been elected Chairman of the Section on Ophthalmology of the College of Physicians of Philadelphia.

Herman Knapp
1832—1911.

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HERMAN KNAPP.

Alexander Duane, M. D.,

New York.

On the 30th of April, 1911, died at Mamaroneck, New York, Herman Knapp—a master mind in all branches of ophthalmology—equally distinguished as a clinician, operator, investigator, author, and teacher.

Herman Knapp was born in Daubold, Prussia, March 17, 1832, his father being Johann Knapp, member of the German Reichsrath. He received the thorough preliminary education, usual in Germany, preparing at the gymnasium in Weilburg, and afterward studying at the universities of Munich, Würzburg, Leipzig, Berlin, and Giessen. That he became proficient in mathematics and the languages will be well understood by those who knew him in after years; but many may be surprised to learn that he was also inclined to poetry, and that at times he even regretted not having devoted himself to this instead of to medicine. However, to medicine he finally turned, receiving his degree at Giessen in 1854. Ophthalmology, which was then just entering on a new phase of its development, soon engaged his attention, and characteristically determining to get the best instruction possible, he visited in turn Paris, London, Utrecht, and Heidelberg. In these cities he studied and did original work under Bowman, Donders, and Helmholtz.

Surely it falls to the lot of few to be associated with such men.

Under their guidance and the mighty stimulus of their example, Herman Knapp, working with an enthusiasm for knowledge and a fiery industry that in his case always seemed limitless, rapidly became proficient in all branches of ophthalmology, and early began to make important contributions of his own to the science. As early as 1859 he made a series of researches in Helmholtz's laboratory, which were of fundamental significance for physiological optics. Their results are presented in his thesis (Habilitationsschrift), on "The curvature of the cornea in the human eye," presented when a candidate for the position of privatdocent at Heidelberg, and in a paper printed the same year on "The position and curvature of the human crystalline lens and the influence that accommodative changes therein exert on the dioptrics of the eye." Appointed privatdocent at Heidelberg in 1859, he became professor of ophthalmology there in 1864, and held this position until four years later, when he decided to come to America. In 1868 he settled in New York, and there remained in active practice till his retirement two or three years ago. In 1869 he established the New York Ophthalmic and Aural Institute, and maintained supreme control of it for some thirty-eight years. During this time about 340,000 cases were treated in the dispensary and the hospital, and of this vast number a great proportion, and especially those that presented any element of seriousness, uncertainty, or singularity came under his personal observation. Here every week day, except when lecturing at the college, he spent habitually three or four hours, examining, operating, and teaching. For, from the first, the Institute was much more than a mere dispensary and hospital. It was used as an effective means for teaching ophthalmology, and great numbers of men from all parts of the country, including some of the most distinguished American ophthalmologists, received their instruction there. Of most of these, it is safe to say, that here they acquired their real foundation in ophthalmology, and some among them have gratefully acknowledged that to Herman Knapp they owe all that they know. Certainly there were very many to whom his demonstrations and instruction were revelations of what a scientific method should be, and to whom his energy, enthusiasm, and love of truth were a lasting inspiration.

From 1882 to 1888 he held the position of professor of ophthalmology in the University Medical College, and from 1888 to 1902 the same chair in the College of Physicians and Surgeons. In 1902 he retired from the latter with the title of professor emeritus.

Dr. Knapp's private practice was enormous. From eight till one every day his waiting room was crowded with patients. An unusual proportion of these, moreover, were cases sent to him in consultation from all parts of the country—cases whose obscurity or importance required accurate and detailed examination. While seeing so many necessarily involved rapidity of examination, it did not in his case imply superficiality. Often devolving the minutiæ of refractive work upon his associates, he let no other important aspect of his cases escape him. His mind had that trained alertness that enabled him to grasp the salient points of a case at a glance, and go directly to the heart of the matter, both in respect of diagnosis and treatment. So, too, his notes describing any important condition were models of directness, brevity, and precision. He was a master of ophthalmoscopy and extremely skilful in the estimation of refraction by the direct method. As a therapeutist he seemd to have that sort of intuitive judgment which enabled him to pick out, without rendering any special reason for it, the treatment appropriate to the case in hand. In operative work he was deliberate, but never slow; courageous, but not rash; cool, methodical, judicious, resourceful. In this as in other things he sedulously avoided all show and pretense; and his wide knowledge and experience were combined with a careful study of operative technique and a sturdy common sense, which led to the most successful results. In the major operations particularly, such as cataract and iridectomy, he was specially skilful, careful, and resourceful; and in these he won a deservedly high measure of success and was universally regarded as a master.

Dr. Knapp's ingenuity is attested by a number of inventions, all having a peculiarly practical character. Among them may be mentioned his head rest for the Helmholtz ophthalmometer, his ophthalmoscope, his apparatus for demonstrating the course of the rays in astigmatism, his ophthalmotrope, his eye speculum, lid clamp, cystitome, knife needle, roller forceps, and operating chair.

A most important contribution made by Dr. Knapp to the progress of ophthalmology in America was the establishment in 1869 of the *Archives of Ophthalmology and Otology*—later divided into the *Archives of Ophthalmology* and the *Archives of Otology*, and published also in Germany as the *Archiv. f. Augenheilkunde* and *Zeitschrift f. Ohrenheilkunde*. In this publication he always attempted to maintain a high degree of excellence, admitting such original contributions only as seemed of real value, and striving to present in addition a serviceable abstract of all important original contributions elsewhere published.

His own contributions to literature were very extensive. His work on intraocular tumors, which appeared in German in 1868 and in English in 1869, brought him great and wide reputation. It was, indeed, probably the first thing to make him universally known and was accepted everywhere as an authority. Another important work—important because, like the other, it was authoritative, original, lucid, practical—was his monograph on operations in Norris and Oliver's System. This filling over 160 pages, was almost a book in itself. But the great bulk of what he wrote appeared as papers published in the *Archives* and other journals. Collected they would fill many volumes and would afford a very fair idea of the progress of ophthalmology during the past fifty years.

Surprise was often expressed that he did not write a textbook on ophthalmology. Asked himself why he did not, he characteristically answered that to make a re-hash he was unwilling, to write an original treatise he was not competent. The world will regret his decision, for he combined three capital qualifications—unequaled experience in all phases of ophthalmology, a minute and extensive acquaintance with the literature, and a judgment and sense of proportion which would have enabled him to give each topic its proper allotment of space and emphasis.

In medical societies, local, national, and international, Dr. Knapp was always a prominent figure—his papers and discussions being received everywhere with respectful attention. The reverse of oratorical, and handicapped by some difficulties in expression, which always clung to him in spite of his careful study of English, he yet had so much of importance to say that few felt that they would willingly lose any part of his communications.

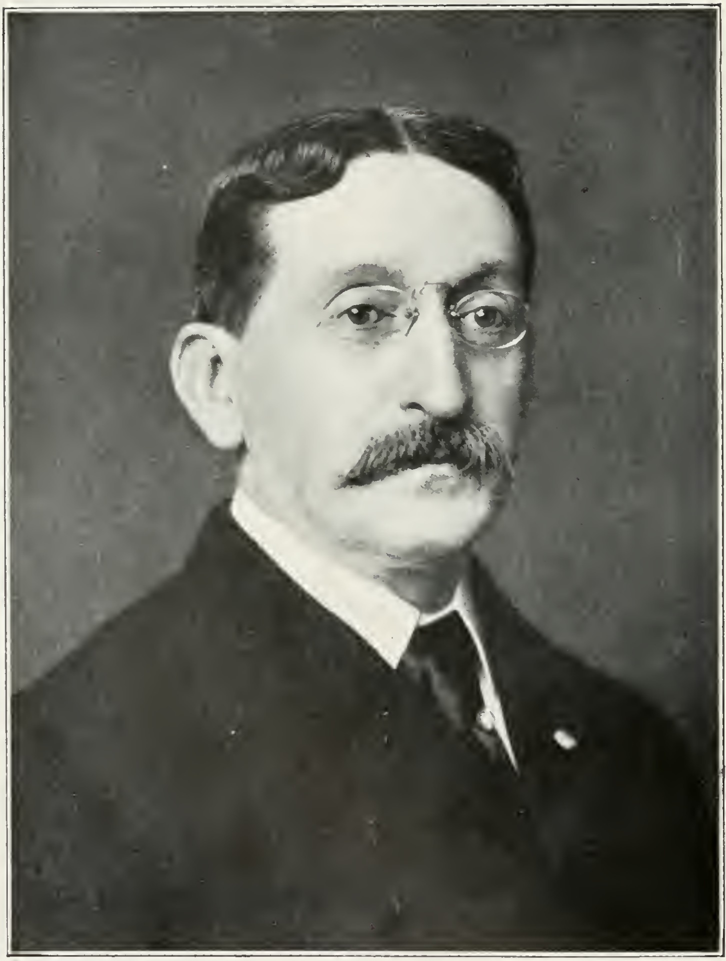
It remains to speak of his character as a man. Few men have been more misunderstood. His obvious characteristics, and the only ones that some carried away from a chance meeting, were his boundless vitality, energy, and enthusiasm, his rather blunt directness of speech and manner, his absolute independence that made no distinction between rich and poor, and the frankness with which he opposed anything that seemed to him wrong and with which he exposed anything like bombast or pretense. From these first impressions some gathered that he was cold and hard and had little regard for the feelings or opinions of others. Longer acquaintance soon modified this view. It showed him to be tolerant of honest mistakes in others, prompt to acknowledge mistakes of his own; open-minded and broad-minded; fair and candid in argument; seeking and always admitting the truth. If forty years of teaching had made him appear somewhat positive and dogmatic, he yet all his life retained the rare quality of being always as ready to learn as to teach. If he had the profound erudition of the scholar, he had also the overruling common-sense and the progressive spirit of the truly practical man. If he gave credit sparingly, it was evidently because his standard was high, and praise from him was prized all the more, because it was not lightly awarded. A somewhat stern critic of others, he was equally critical of himself.

Those who observed him from day to day, quickly learned that to the call of duty he was unswervingly obedient. Dr. Parkhurst fitly said of him, that his profession was his religion. To it indeed he dedicated his life.

As one got to know him better, it was soon found, too, that to a singular degree he had the simplicity that marks true greatness. Never was man more unostentatious. Testimonials, dinners, celebrations were offered to him in vain. He would have none of them.

Those who penetrated still deeper into his personality discovered the real kindliness of the man, the depths of feeling beneath the unemotional exterior, the sincerity and value of his advice, and his readiness to help those that he deemed worthy of help, whether it were some struggling colleague, or the poor to whom, as we all knew, he gave the most unstinted service.

By the scientific world in general, Herman Knapp will be remembered as one who, beginning with his pioneer work under Helmholtz, for nearly fifty years continually enriched ophthalmology by his important contributions. By Americans he will be honored as the man who did more than any other to introduce scientific ophthalmology into this country, and who by example and precept established the science on a firm footing here. By the many who were fortunate enough to be under his tutelage, he will be reverenced as an inspiring example, an informing teacher, a model clinician, a helpful counsellor and a true friend.



Charles Stedman Bull
1846—1911.

CHARLES STEDMAN BULL.

M. E. Tully, M. D.,

New York.

Dr. Charles Stedman Bull was born in New York City in 1846, and died there April 17, 1911. He was of colonial ancestry on both sides of the family, and of Huguenot descent on the maternal side.

He was educated at the Chadier Institute of New York, and at Columbia University, from which institution he was graduated in 1864. He then matriculated at the College of Physicians and Surgeons, taking his medical degree in 1868. After serving eighteen months in Bellevue Hospital as interne, he spent two years in Europe studying at Vienna, Berlin, Heidelberg, Utrecht, Paris and London, devoting his time to ophthalmology and pathology under such teachers as Arlt, Graefe, Jaeger, Helmholtz, Virchow, De Wecker and Donders.

Returning to this country, he practiced for a short time in St. Louis. Afterwards settling in New York, he devoted himself exclusively to ophthalmology. In 1871 he was assistant surgeon to the Manhattan Eye and Ear Hospital. In 1873 he became assistant surgeon to the New York Eye and Ear Infirmary, and surgeon in 1876. He was also a director of the New York Eye and Ear Infirmary for many years.

Dr. Bull was an early contributor to ophthalmological literature. In connection with Dr. D. B. St. John Roosa he translated Stellwag's text-book on Diseases of the Eye (the fourth American from the fourth German Edition).

He began well equipped for his work, and, as he was always a close student and had command of several modern languages, could go to original sources for his information. Nothing of value to ophthalmology escaped his attention. He was a prolific writer and a clear thinker. His articles were well abreast of the advancements in ophthalmology and covered most of the subjects embraced in that specialty.

In later years he gave more attention to glaucoma, and auto-intoxication as a causative factor in diseases of the eye. As a teacher his grasp of the subject enabled him to present it so well defined as to be easily understood. He was an excellent diagnostician, a good clinician, and a successful operator. His services to ophthalmology were valuable, and rank him among the foremost of his specialty in this country.

He was at different times connected with the City Hospital on Blackwell's Island, the New York Polyclinic, the Nursery and Child's Hospital, St. Luke's Hospital, and was also Professor of Ophthalmology at the University and Bellevue Medical College. At the time of his death he was Ophthalmologist to the Presbyterian Hospital and St. Mary's Hospital for Children, and Professor of Ophthalmology in Cornell University.

Dr. Bull had for years been prominent in medical societies and was very constant in his attendance and interest. He served as President of the American Ophthalmological Society and was a member of the New York Ophthalmological Society, of the Practitioners' Society, was Corresponding Secretary of the Academy of Medicine, and a member of various national, state and county associations.

Among social organizations he was a member of the University and Century Clubs, of the Society of Colonial Wars in Connecticut, Sons of the Revolution, and the Huguenot Society of America.

Charles A. Oliver.
1853—1911.

CHARLES AUGUSTUS OLIVER.

S. Lewis Ziegler, M. D.,

Philadelphia.

The sudden death of Dr. Charles Augustus Oliver on April 8th, 1911, from pulmonary edema, has robbed ophthalmology of one of its most distinguished practitioners. A brilliant student and a tireless worker, he unfortunately became the victim of his own painstaking methods of recording the histories of his patients. His elaborate studies of the minute details of the normal and pathologic fundus were probably unequaled, but the mental and physical strain which this intense application demanded ultimately undermined his health and resulted in the attack of nephritis to which he succumbed.

Dr. Oliver was born in Cincinnati, Ohio, on the 14th day of December, 1853. He was the son of the late Dr. George Powell Oliver, who was the founder and first president of the Medico-Chirurgical College of Philadelphia. He received his degree of Bachelor of Arts and the subsequent Master of Arts, in course, from the Central High School of Philadelphia. He also had conferred upon him the honorary degree of Master of Arts by Lafayette College. He was graduated in medicine from the University of Pennsylvania in 1876 and served one year as Resident Physician in the Philadelphia Hospital. During the following year he became connected with the Wills Eye Hospital as Clinical Clerk, in the service of Dr. William F. Norris, who was then Professor of Ophthalmology at the University of Pennsylvania. His association with the Wills Eye Hospital was uninterrupted from that time until his death, having been elected Attending Surgeon to this institution, with its enormous clinical and teaching facilities, in 1890, and having served as Secretary to the Surgical Staff during the whole of that period.

He helped to establish a clinical service for diseases of the eye at St. Mary's, St. Agnes' and the Presbyterian Hospitals and on retiring from active service in the two former institutions became Consulting Ophthalmic Surgeon. In 1894 he was appointed Ophthalmic Surgeon to the Philadelphia Hospital, which placed at his command the immense indoor operative service of that large institution. He was made Associate Clinical Professor of Ophthalmology in the Woman's Medical College in 1897, and became full Clinical Professor in 1906, a position which he filled with distinction until 1909. He was also Consulting Ophthalmologist to the Friends' Asylum for the Insane, and to the State Hospital for the Chronic Insane of Pennsylvania.

His knowledge of the literature of his specialty was most comprehensive and his own contributions were both valuable and voluminous. One of his most important publications was a "Text Book of Ophthalmology," written in collaboration with his teacher, Dr. William F. Norris, which enjoyed a full measure of popularity in this country and was later translated into Chinese by Neal of Chinanfu, and adopted as a text-book in the medical schools of China. His well-known monograph entitled "A Description of Some of the Most Important Ophthalmic Methods Employed for the Recognition of Peripheral and Central Nerve Disease" was translated into French by Baudry of Lille, and into German by Wolff of Berlin.

His monumental editorial work consisted in the personal supervision of Norris and Oliver's "System of Diseases of the Eye," in four volumes, to which more than sixty American, British, Dutch, French, German and Spanish authors made contributions. He also translated and edited the English editions of Ohlemann's "Ocular Therapeutics," Baudry's "Injuries to the Eye in Their Medico-Legal Aspect" and Donders' "Essay on the Nature and the Consequences of Anomalies of Refraction." More recently he contributed to Wood's System of Ophthalmic Operations a comprehensive chapter on "Paracentesis, Keratotomy, Conjunctivoplasty and some other Operations on the Cornea."

He was editor, co-editor and collaborator of many American and foreign publications. His monographs, magazine articles, reviews and abstracts embrace several hundred subjects which lack of space will not permit to be enumerated. Some of the most important of these papers relate to color perception, color blindness and tests for the same: "The Comparative Action of Various Mydriatics on the Iris and Ciliary

Muscle"; "A New Seriesof Test-Letters and Words for Determining the Visual Acuity and Range of Accommodation"; "A New Method for the Implantation of Glass Balls in Tenon's Capsule"; "A Single-stitch Operation for Advancement of the Exterior Ocular Muscles"; "Studies of the Sensory Changes and Conditions of the Ocular Apparatus found in Imbecility, Epilepsy and General Paralysis of the Insane.

He was a member of many medical societies, including the College of Physicians of Philadelphia, the American Ophthalmological Society, the Wills Hospital Ophthalmic Society, the Pathological Society of Philadelphia, the Philadelphia Neurological Society, the Philadelphia County Medical Society, the Pennsylvania State Medical Society and the American Medical Association. He was also a member of the American Philosophical Society, the American Association for the Advancement of Science, the Military Order of the Loyal Legion of the United States, and the University Club of Philadelphia.

In addition to these he held active membership in many foreign societies, such as the Pan-American Medical Congress, of which he was an Honorary Vice-President, the International Medical Congress, the International Ophthalmological Congress, the Heidelberg Ophthalmologischen Gesellschaft, and the Societé Francaise d'Ophtalmologie.

During his extended travels abroad he visited many of the most important eye clinics and hospitals throughout the world and thus acquired a very large personal acquaintance among his foreign colleagues who held him in high esteem. Much of the research work that he placed on record has been recognized as original and authoritative. His distinguished professional career has added lustre to what has been termed "The Philadelphia School of Ophthalmology." His untimely death *in medias res* must be considered a distinct loss to ophthalmology, because of the elaborate work for which he had collected much data and which he was compelled to leave unfinished.

INTRAOCULAR SARCOMA AND SYMPATHETIC INFLAMMATION.*

DR. J. MELLER,

DOCENT AND FIRST ASSISTANT IN THE II UNIVERSITY EYE CLINIC OF PROF. E. FUCHS, VIENNA.

I.

The following paper is the result of study of cases of intraocular sarcoma in which the eye containing the tumor took on a sympathetic infiltration, and the other eye developed sympathetic inflammation.† In the obscure clinical picture of sympathetic disease these cases are the farthest from our understanding. They deviate so very much from the current conceptions of the origin of sympathetic inflammation, that one involuntarily forms other conceptions. I do not wish to add a new theory of sympathetic ophthalmia to the many already existing, nor to attempt to clear up the questions of origin of the disease, yet I think these subjects should be discussed from the standpoint of this type of cases, which, so far as I know, has not been done.

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*Authorized translation from "v. Graefe's Archiv. für Ophthalmologie," LXXII, Band, I. Heft., pp. 167-196. Leipsig, Wilhelm Engelmann, 1909, by Dr. W. Monroe Jones, Assistant Eye Surgeon, Clinic of Dr. E. V. L. Brown, Illinois Char. Eye and Ear Infirmary, Chicago.

†The German phrase "Sympathisierende Entzuendung" refers only to the inflammation in the first affected (primary, exciting) eye. Here and elsewhere in this article it is translated as sympathetic inflammation because there is no other word in English which can be used in reference to the phenomena in the primary eye; and, indeed, the term "Sympathetic Inflammation" is used by English and American writers for the process in either one or both eyes. Following this usage of the English writers and such texts as de Schweinitz and Weeks in this country, the first affected eye will be spoken of as the primary, or exciting eye, and the second, or fellow eye, referred to as the sympathizing eye throughout this translation. —W. M. J.

II.

To what conceptions of sympathetic ophthalmia have the facts so far adduced, led us?

1. Sympathetic ophthalmia is a specific disease of the uvea which is indeed well characterized histologically. It involves the uvea of the first eye and causes the formation of a granulation tissue consisting of lymphocytes, epithelioid and giant cells. This disease of the tissues is a specific one, and, just as much as tuberculosis or syphilitic infiltration of the uvea, is caused by a definite virus.

2. This sympathetic uveitis is entirely different from other forms of uveitis, since they occur either spontaneously or develop very frequently after injuries. Especially to the researches of Fuchs do we owe the clear separation of the histologic picture of endophthalmitis following injuries from that of sympathetic infiltration. He has shown us that sympathetic infiltration histologically depends in nowise upon endophthalmitic infiltration, that the sympathetic infiltration may exist alongside of endophthalmitic inflammation and can be differentiated from it by us and that it may occur without endophthalmitic inflammation.

3. The expression *specific* is suitable not only for the histologic picture, but also for the localization of the disease. It is established that it is the uvea, mainly, that is involved in each of the eyes. The virus in question finds suitable soil for development only in the uveal tissue; in the second eye, as in the first, it is the uvea that is the first and principal seat of the disease. Later the growth of sympathetic infiltration can, to be sure, become aggressive. This aggression is shown in a minor way by the extension of the infiltration into the

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The expression "Sympathizing Inflammation" is often incorrectly used by German teachers when referring to the primary eye. Schirmer (v. Graefe's Arch. f. Ophth., Band 38, Heft. 4, pp. 95-297, 1892) first used the expression "Sympathiziertes Auge" for the second eye. He thought in this way: the first eye sympathizes the fellow eye, therefore the fellow eye is the sympathized eye, and the first eye the sympathizing one. Schnabel (Wiener medic. Wochenschrift, No. 29 and 30, p. 1451, 1902) protested against this expression of Schirmer's, as also does Elschnig (v. Graefe's Arch. f. Ophth., Band 78, Heft. 3, p. 566, 1911). Schnabel referred to Schirmer's expression as one "injuring the spirit and form of language making its meaning difficult." Nevertheless Schirmer's terms are in general use in German.—E. V. L. B.

vessel lumen, and in a greater way, when, as occasionally happens, the whole eye is filled by the sympathetic infiltration, the sclera is broken through, and large extraocular nodules formed.

III.

These are the most important facts that have been established concerning sympathetic ophthalmia. No wonder that writers have endeavored to answer the many unsettled questions by theories. And it is the manner and means by which the second eye becomes diseased that has almost exclusively claimed the attention of the ophthalmologist. Dissertations thereon fill volumes. Theories were set up and an incredible diligence and patience used either to prove their correctness or incorrectness. I mention, among others, only the names of Leber, Deutschmann, Schmidt-Rimpler, Schirmer and Roemer. I have no intention of going into these questions at all at this time, for I believe that the first question, aside from the nature of the disease exciter, the solution of which is awaited, is: In which way is the first eye infected? At an early period the most varied diseases of the second eye were looked upon as sympathetic ophthalmia; and when it became evident that only uveitis is drawn into the range of consideration the attempt was made to designate every uveitis as sympathetic. Later on the sphere of sympathetic ophthalmia became more and more limited. Yet one fact, established indeed, by the earliest observers, found corroboration throughout, namely, that sympathetic ophthalmia arises with especial frequency after injuries. Later came the conception that sympathetic ophthalmia is caused by a certain virus, a microorganism, and it was natural to think that this came from the conjunctival sac, and got into the eye through an operation wound, a perforating ulcer, or an accidental opening, and wrought its deleterious effects. The teaching that the disease exciters migrate from the conjunctival sac through the perforation has been an axiom not only in the earliest systematic studies of sympathetic ophthalmia, but it is even to-day, so that all modern authors, who go with renewed energy into the investigation of this disease, assume it as something self-evident and henceforth not even to be brought into discussion.

to say nothing of placing it in question. Since actual knowledge concerning these disease exciters was wanting, the attempt was made to substitute hypotheses. Thus zur Nedden assumed "that the exciters of sympathetic ophthalmia are usually present in the normal conjunctival sac, and that the conjunctiva is a suitable soil for the growth of the exciters, and for the retention of their virulence." Without coming out against this assumption, Roemer, on the other hand, cannot but remark: "If the exciters of sympathetic inflammation were a regular inhabitant of the normal conjunctival sac this disease would be much more frequent than it is."

IV.

In the observations which now follow I will give consideration directly to the question of which way the infection in the first eye originates. A priori two ways must be acknowledged as possible: infection from without through a perforation of the eye, as just described, and the endogenous way. The circumstance that the great majority of eyes which lead to sympathetic ophthalmia have been injured, certainly favors an ectogenous infection. It is, however, not indisputable proof of it. No one can deny the possibility of an endogenous infection in an eye which at a more or less remote period has met with an injury and has been thereby more or less changed. I would therefore like to attack the problem of the infection of the first eye by a study of eyes in which an ectogenous infection is excluded. This task is rendered very difficult by the fact that a greater part of the cases of sympathetic ophthalmia cannot be drawn into this sphere of consideration on account of a previous injury. Notwithstanding this, the existing material is surprisingly large.

This brings me up to the consideration of the real subject matter of my paper, namely, the relation that exists between intraocular tumors and sympathetic inflammation, and before I go further I will first report a case of this kind.

G. P., 28 years old, waiter. History, dated June 27, 1901. Patient has been blind in the left eye for seven years, i. e., since his twenty-first year. The cause is entirely unknown. The right eye has also been affected since the beginning of this month. At that time it became red and painful, and he began to see all objects as through a fog. No evidence of congenital or acquired lues is present, and no articular rheumatism has affected the patient. The urine is normal. Present condition: R. E. External parts are normal. Moderate conjunctival injection and vivid brick red ciliary injection are present; the cornea is clear and bright; on its posterior aspect are many precipitates, the camera anterior is of normal depth, the aqueous humor cloudy. The iris is swollen, its pattern slightly effaced, especially below. The atropinized pupil is partially dilated, but only downward and outward. Tension is normal. Vision equals fingers at 4 meters; the fundus not visible. L. E. External parts are normal. Conjunctival and ciliary injection is present. The cornea clear and transparent, with the exception of marginal vascularized opacities. The camera anterior is deep, iris blurred, hyperemic. Out and down one sees individual white flecks surrounded by markedly hyperemic tissue. The pupil, widely dilated by atropin, is oval inward and upward. The diffusely grey clouded lens seems dislodged somewhat inward and upward. In contrast to this, there is a yellow green folded and markedly prominent mass which clearly belongs to the capsule. Tension is normal; the fundus not visible. The eye is amaurotic. In the further course of the case, both eyes, especially the left, continually got worse. In the right eye recurring precipitates formed on the posterior surface of the cornea, so that, after a transient improvement, the vision got worse each time. At the end of July there appeared under renewed marked inflammatory symptoms many precipitates on the posterior corneal surface, and a small sectorform opacity began to push forward from below into the deep layers of the cornea. Early in August two other deep lying sectorform opacities, beginning at the lower, outer border of the cornea, were added, and late in August the left eye was finally removed on account of pain. When the patient left the clinic about the first of October, the right eye still had ciliary injection, a dull and stippled cornea, and a very shallow anterior chamber. The iris was greenish, discolored and swollen, there were many precipitates, the lens had taken on a dull grey opacity, and the pupil was bound down by many synechiæ. The vision was reduced to the counting of fingers at one meter.

I took the bulb from our collection of enucleated eyes for histologic examination accidentally. When I sectioned it vertically, I found that the posterior half of the bulb was filled with a nodular mass which had broken backward through the sclera.

Histologic Findings.—Cornea: Epithelium and Bowman's membrane show no peculiarities. The limbus is infiltrated with small cells; in the periphery are numerous superficial and especially deep vessels around which is an increase of cells. Below, the periphery of the cornea is thickened by an infiltrate lying in its deepest layers, and the membrane of Descemet is thereby bulged toward the camera anterior. This infiltration is, as I here anticipate, identical with that lying in the iris and ciliary body. It has pushed from the chamber angle into the corneal parenchyma. It consists of lymph cells, which enclose, dike-like, a cluster of epithelioid cells. The corneal lamellæ are forced apart a little by this infiltrate, without themselves suffering any essential damage. The posterior surface of the cornea is covered in part by a quite diffuse exudate, and in part by small areas of precipitate. Where the exudate is present, the corneal epithelium has in part suffered, and in part remained pretty well intact; in the region of the actual precipitate, however, it is completely gone. The cells of the exudate are all mononuclear and consist either of only a nucleus or have a distinct surrounding protoplasm. The most of them are somewhat larger than lymph cells.

Iris: Above, the iris protrudes as a short stump, a little posterior to the back of the cornea, and is curved backward at its root margin; almost nothing is preserved of its original tissue. Only individual branched stroma cells are still present. Otherwise it is replaced by an infiltrate which is much thicker and more abundant in the posterior portion near the pigment layer. The infiltrate consists throughout of mononuclear cells, of which only the smaller part are lymph cells, while the remainder represent plasma cells; they have a distinct plasma cell body colored pale red with eosin, the nucleus eccentrically placed, sometimes the surface a little raised. Overfilled larger and smaller blood vessels run everywhere through the iris. There still remain some sphincter bundles imbedded in the infiltrate. Upon the surface of the pupillary part of the iris lies a membrane of new formed connective tissue which is in connection with the surface of the ciliary body, encloses the lens, and by the shrinking of its posterior portion assists in bending the iris backward. The root of the iris is so attached to the posterior corneal surface that the spaces of Schlemm's canal are entirely isolated from the chamber. Elsewhere the iris is not recognizable as such, for it is everywhere substituted by infiltrate. The same cellular infiltration as that found in the iris itself is also found here about the lumen of the canal and spreading out between the lamellæ of the sclera. The ciliary body is filled out in its entire extent by an infiltrate in which even the epithelial leaf has given way. Of the latter only some remnants indicate the original position of the ciliary processes. The disease affects the elevated and smooth parts of the ciliary body in the same way. Only in the loose meshwork of tissue fixing the ciliary body to the sclera does the infiltration remain scanty. In the region of the ciliary body there are, for the first time, two types of cell infiltration: this is made noticeable by the fact that the principal infiltration mass permeating the ciliary processes and the inner part of the flat section of the ciliary body consists of bright rose-red cells, while the peripheral scleral parts are filled out by a wall of dark blue nuclei. The first is made up in part by the plasma cells already described, in part by numerous typical epithelioid and giant cells, while the blue colored nuclei are lymph cells. The infiltration has even extended beyond the retinal leaf of the ciliary body toward the center of the eye, and the unpigmented leaf is displaced, to the greater extent. The latter is relatively well maintained, while the pigmented leaf is almost entirely destroyed. The infiltration has, however, penetrated even the unpigmented leaf and extended over into the inner part of the eye. Even the posterior chamber is filled by the infiltrate, for it has frequently eroded the pigment epithelium of the iris, and in one place broken through it.

If possible the changes that involve the iris and ciliary body of the lower half of the bulb are still greater, but their nature is quite the same. The iris is only present as a short prominent exudation nodule. It, along with the ciliary body, is united with the ciliary body into a large infiltration mass so that the original tissue is no more present. Here, also, the unpigmented layer of the retina is maintained in a better condition, though widely separated from the other layer by infiltrate and serous exudate. Epithelioid and giant cells are found in large numbers. Here, also, the loose tissue attaching the ciliary body to the sclera is the least infiltrated. The infiltrating cells lie isolated in this situation. Among them one finds many plasma cells.

The anterior lens capsule has a very thick capsular cataract throughout its entire expanse. Upon its surface lies a thin exudate layer. Because of the intense infiltration the ciliary body reaches from below up to the equator of the lens, and for a considerable extent lies against it. Above, the ciliary body lies away from the lens equator for a greater distance. The space here is filled out with spindle-form cells, and in the meshwork of the space are many plasma cells and blood vessels. The lens itself is imbedded in a firm tissue, which consists of parallel fibers of connective tissue, and contains numerous connective tissue cells. This tissue reaches forward to where the capsular cataract begins. The inner surface of the capsule is covered in its equatorial region by a pseudo epithelial coating, which also extends over upon the posterior capsule. Posteriorly the lens is imbedded in a still younger organizing tissue, which is permeated with blood and blood pigment. In its lower half the posterior lens surface is bordered by an older blood extravasate in which the red blood corpuscles have already fallen into a far advanced stage of decay. The lens substance itself fell out when the eye was sectioned, and only individual remnants of cortical substance remain as parts of disorganized fibers.

Chorioid, in the region of the ora serrata in the upper half of the bulb.—The anterior part of the chorioid is detached from the sclera by a hemorrhage. In the ciliary body the infiltration is very extensive, but it has caused only a very small increase in the thickness of the chorioid. The infiltration consists of lymph and plasma cells. In places it pushes the chorioid somewhat inward and breaks through it; at these places the lamina vitrea is better preserved than the pigment epithelium, which, indeed, is injured to the greatest extent. The position of the ora serrata can no longer be recognized with certainty. One finds here an old connective tissue membrane permeated partly with old, partly with fresh, blood pigment upon the inner aspect of the chorioid; it, too, is permeated by an infiltrate on the side turned toward the chorioid. One finds imbedded in it cells that may correspond to the most anterior part of the retina. The unpigmented cells then extend farther forward and are drawn inward, forming a framework in which the infiltration has likewise penetrated. The ora serrata region of the lower half of the bulb shows quite analogous relations. It is even more indistinctly marked; the framework, here also, consists of long-drawn-out nonpigmented cells, and, too, there is a membrane lying upon the chorioid permeated with pigment and infiltrate.

Posterior Half of Bulb.—One sees with the naked eye that the posterior half of the bulb is filled out with a large nodule. Immediately behind the lens lies a hemorrhage, and in particular sections there may still be found some signs of the quite necrotic cells of the tumor. The sclera broadens out toward the posterior pole, i. e., it goes over into a tough membrane in which are placed many nodules 1 to 3 mm. in cross section. Behind this there is found a large, sharply delimited node measuring 5 mm. in diameter and staining bluish red by hematoxylin and eosin. Near it are several smaller nodes.

I shall first describe the histology of the nodules, then their relation to the membranes of the eye, especially to the chorioid, and finally its relation to sympathetic infiltration. The nodules show a spindle cell sarcoma, which has originated in the posterior portion of the chorioid. They consist of chains of cells interwoven in various directions and therefore representing various forms in cross section. In longitudinal section they are seen as spindle-form cells, with a bright rose colored protoplasmic body, the nucleus of which has taken on a quite intense blue color. The nuclei are elongated, and the cells lie so close to each other that one can scarcely distinguish the individual protoplasmic bodies. The spindle shaped cells form trains of varying widths. Between them lie transverse cell bundles. Here one sees cross sections of nuclei which are wider or narrower, according as they are sectioned near the middle or end. The cell bodies are flattened by their close apposition, so that on cross section they no longer appear round but angular. The protoplasmic border of the cells is narrow, the cell outlines are indistinct, so that it is almost impossible to say whether the nuclei are in the middle of the cell body or disposed mainly near the edge. Cement substance is scarcely recognizable. Scanty blood vessels traverse the growth; their walls consist of a thin endothelial tube. Only in a few parts of the tumor are the blood vessels numerous, and there one finds marked hemorrhage into the tissue of the tumor. In many sections one sees extensive necrosis, especially in the nodules lying well back. The hemalaun gives to this tumor substance a diffuse blue coloring. Cells are only indistinctly recognized, and at the margin of the necrotic portion an infiltration of small lymphocytes has set in. Even the connective tissue membranes between the individual nodules have become necrotic.

Concerning the relation of the tumor to the membranes of the eye the following is to be said:

The posterior section of the sclera is replaced by a firm "callus" in which the nodules lie. How much of the callus is real scleral tissue is not any more to be determined. Regarding the chorioid the following is to be said: If one goes along this tunic backward from the ciliary body, the changes already described as sympathetic infiltration are encountered. At about the equator the chorioid is nodularly thickened by a dense small-celled infiltration in its external layers, while the inner layers are less infiltrated. The lamina vitrea presents multiple, numerous, wavy lines, the pigment epithelium is almost entirely destroyed, and upon its inner side are lodged individual round cells. This node-form infiltration of the chorioid borders a sarcomatous nodule, which pushes the outer layers of the chorioid inward and at the same time is beginning to destroy the lamellæ of the sclera. This sarcoma nodule is bordered by a firm membrane toward the inside of the bulb. Its origin from the inner layers of the chorioid is shown by the fact that one can follow the lamina vitrea on its inner side as a much corrugated glistening line. Immediately beneath this lie cells of the sympathetic infiltration in a much varying quantity, while the parenchyma of the chorioid itself is transformed into an almost homogeneous basement substance, colored pale rose with eosin, in which are contained sparce cells—partly branched and nonpigmented, partly round cells and some few plasma cells—and sparce vessels. Upon the vitreous body side of the chorioid there is also found a connective tissue membrane which likewise is very firm and contains few cells or blood vessels.

At the base of the nodule, where it begins to stand out, the lamina vitrea is separated from the tumor by the inner layers of the chorioid, and although these have undergone connective tissue changes the tumor itself and its cells are quite sharply delimited; at the summit of the tumor, on the other hand, the lamina vitrea is approximated to the tumor, and in place of the connective tissue membrane between it and the tumor there intervenes a thick infiltration consisting almost exclusively of lymphocytes and only a few plasma cells, and these cells penetrate the tumor so that here the border between the two diseased areas is most effaced. A very thick membrane lies upon the inner aspect of the chorioid here, yet fresh trains of infiltration cells, lymphocytes and plasma cells are still present. The pigment epithelium has suffered most; only a few pigmented clumps remain. In the depression found between the first and second nodule the last remnant of the real chorioidal tissue is lost, but even this second nodule is only covered over by a thin connective tissue membrane, poor in cells, and separated from the inflammatory infiltration without there being a trace of any element of the chorioid present. The surfaces of the adjoining large nodules, which project most into the anterior portion of the bulb, still show a thin connective tissue membrane, but no sympathetic infiltration. A large hemorrhage completely filling out the space between the nodule and the posterior lens surface, lies on the surface. As stated above, this hemorrhage is completely necrotic in places. The chorioid in the upper part of the bulb is much more changed through inflammation than in the lower half. Where the tumor begins to bulge forward it is represented only by a connective tissue membrane, in which are some infiltration cells. Upon its inner surface lies a hemorrhage. At the base of the tumor a small-celled infiltration is found among the sarcoma cells, and indeed is to be considered as a penetration of the infiltration into the tumor. That the membrane drawn up over the tumor really proceeded from parts of the chorioid follows from the fact that a verrucous degeneration is found some distance farther on, along with remnants of the lamina vitrea below, and a massive plasma cell infiltration. Furthermore, the top of the nodule is wrapped in a thin connective tissue membrane almost free from cells, while the lamina vitrea remains intact in the form of a very wavy line. Then again, the lamina vitrea enters the tumor quite straight and has beneath it an infiltration of lymphocytes and plasma cells which penetrate the surface of the tumor, while upon the vitreous body side of the lamina vitrea there lies a very thin membrane. Then follows, again, a thick sympathetic infiltration in the valley between this first nodule and the large middle one already mentioned. Here the lamina vitrea is even yet distinctly preserved, and on both sides of it lie a profusion of infiltration cells. It then disappears so that upon the surface of the large nodule itself no remnants of the chorioid are to be seen. This nodule is covered by a firm, thick connective tissue membrane in which, besides vessels with markedly thickened walls, lie irregularly clumped remnants of pigment epithelium.

To recapitulate, one can follow the inner layers of the chorioid from both sides far up onto the tumor, while upon the summit itself it is absent, since it has been broken through by the tumor. In none of the sections is there anything to be found of the retina or optic nerve. Bacteriæ are not to be found.

SUMMARY.

The clinical history is unfortunately so deficient that no definite conclusions can be drawn from it. The blinding of the eye seven years previously is in any case to be held to be due to the sarcoma. Unfortunately all statements fail as to whether or not the blindness of the eye was preceded by inflammation, and how the eye has behaved since that time. The thick membranes which are found in the anterior half of the bulb, enclosing the lens and lying upon the ciliary body, as well as the transformation of the posterior half of the sclera into a wide, firm callus, are indications that at one time a severe plastic inflammation must have taken place in this eye. This was caused by a necrosis of the existing tumor. The few cell fragments of the tumor still remaining were inclosed in life in a firm capsule by means of the inflammation, and so remained for years. Finally, however, they broke forth and filled up the entire posterior part of the eye with nodules, in which necrosis soon set in. In as far as the uvea had not been destroyed by the sarcoma, it gave way to sympathetic infiltration. I venture no definite opinion as to how long the sympathetic inflammation may have existed in the eye. Since sympathetic ophthalmia was present early in June and the enucleation done August 23d, the sympathetic changes must have been at least three months old. Very likely they are not much older. In any event, there is nowhere any evidence of the regression described by Fuchs.

The bulb was sectioned serially without a break, and nowhere was a cicatrix found. Posteriorly the tumor had grown through the callus which replaced the sclera. However, a communication between inside the interior of the eye and the outer world had not been present, because neither was the anterior part of the bulb perforated nor had the tumor progressed toward the orbit, nor had it effected a perforation toward the nose. In my opinion, the time relation between the reappearance of the sarcomatous growth and the sympathetic infiltration cannot be determined from the findings. A term of months must, however, have intervened before the latter began. Possibly the development of the sympathetic infiltration is connected with the fresh necroses of the new-formed tumor nodules.

The sympathetic infiltration corresponds in all its details to the classic description of it by Fuchs, hence I have nothing further to report concerning it. Special mention need only be made of the sympathetic infiltration of the cornea. Clinically this appeared as a sclerosing keratitis, since it pushed forward in many places from the periphery of the cornea toward the center.

The infiltration is related to the tumor only in so far as it occupies those portions of the chorioid which mount up over the tumor and are not yet attacked by the tumor. In this border region one also finds isolated areas of sympathetic infiltration in the middle of sarcomatous tissue. In the more remote sarcoma nodules there is indeed a collection of round cells. This infiltration may, however, be independent of the sympathetic infiltration, and be brought about by necrosis of the tumor tissue. These round-cell foci consist exclusively of small lymphocytes. An exception occurs only where the sympathetic infiltration, and the tumor as well, are forced out through the sclera along the vessels. Along a vein running between the scleral lamellæ in the lower half of the bulb one finds an infiltration made up of lymphocytes and plasma cells. These cells are closely placed around the vessel, and the tumor has grown out in the same way, so that the tumor cells are near to and partly mixed with the cells of the infiltration in the intrascleral nodules.

V.

In order to present a review of the other cases of intraocular sarcoma with sympathetic ophthalmia known to the literature, I give herewith the presentation of this question elaborated by Schirmer and published in the second edition of the *Handbook*. Of the 30 cases in the literature, there remain 13, according to Schirmer, in which there really had been a sarcoma of the chorioid in the one eye and a sympathetic inflammation in the other eye. In this connection one must remember that for some years the lack of knowledge concerning the characteristic histologic nature of sympathetic ophthalmia made the diagnosis often doubtful. Of these 13 cases, 5, first of all, must be excluded from consideration because the tumor in these had broken through the bulb. To these must be now added the 3 cases of Fuchs, published in *Graefe's Archives*, Band LXI, Heft 2, 1905, and the one reported herewith by me. In these, the anterior capsule of the bulb remained intact, and consequently no communication between the inner eye and the outer world occurred, because the tumor was only pressed backward toward the orbit.

The fact that sympathetic inflammation occurs in that part of the uvea which is still unattacked by the tumor, in spite of the lack of perforation outward (in indeed, even a completely intact bulb capsule) is indisputable proof that the infection of the first eye in these cases is brought about by endogenous means, and that the endogenous route as a means of infection of the first eye must be drawn into discussion for sympathetic ophthalmia in general. The question arises: If a sympathetic inflammation can be lighted up in an endogenous way by an intraocular sarcoma, why should not the infection of the first eye also arise in this same way in the other cases of sympathetic ophthalmia which follow perforation of the eye? We must at least undertake a working over of the known facts to determine whether they form a basis for the one or the other theory of infection.

If the present status of our information is correct—that microorganisms cause sympathetic inflammation, and, as above demonstrated, an infection of the first eye can be endogenous, the specific organisms must circulate in the blood, even though only occasionally. All authors agree that a wide propagation in nature must be conceded to the exciters of sympathetic ophthalmia, and Deutschmann has already asked the question why it is that inflammation similar to sympathetic inflammation never occurs in one or both eyes following infected wounds of other organs, although the other organs are severely inflamed. Nothing whatever of this nature is known to occur. Even Roemer, who likewise had the opinion that the infectious organisms reach the eye through the wound, said: "That the organisms in question at times get into the body and are transported by way of the blood stream to the eyes, cannot, to be sure, be definitely denied. We must always reckon with the possibility that in the group of spontaneous iridocyclitis cases there may be found those in which such exciters moreover come into play." This, of course, brings into consideration the rationale of those cases of spontaneous chronic iridocyclitis in which the anatomic findings cannot with certainty be differentiated from those of the sympathetic inflammation by the aid of present-day methods; for example, the two cases of this kind which were recently published from our clinic, with the consent of our chief, by Botteri. I will, however, proceed upon the basis of the facts and keep as far as possible from hypothetical views.

We must first establish the fact that a previously healthy eye does not primarily become diseased with sympathetic ophthalmia. In the cases of spontaneous chronic iridocyclitis just mentioned, presenting the anatomic picture of sympathetic inflammation, the most important proof of the identity with the real sympathetic affection fails, i. e., the disease of the other eye. I can, therefore, rightfully rule these cases out of the discussion. The eye is always one which has been previously injured, and we can still more definitely state that it is the uvea which has already been injured, and which becomes the seat of the sympathetic disease. The objection of Deutschmann, mentioned above, does not speak against an infection from the blood, for it can be contended that organisms thus occasionally circulating in the blood are incapable of growing in the uvea of a healthy eye and that this would be possible only when the uvea is previously damaged in some way. This important factor has been practically overlooked in most discussions.

What are the known damaging factors by which an eye is placed in a condition to be attacked by sympathetic ophthalmia?

(a) In the first place, perforation of the eye must exert such an influence upon the uvea. Perforation with its sequelæ—adhesion of the iris to the cornea, etc.—may not necessarily be the principal factor therein, but probably an inflammation introduced into the interior through the perforation, an inflammation produced by known organisms and which calls forth such injury to the tissues. It is known that the plastic exudation, which, as Fuchs has shown, does not belong to the essence of sympathetic inflammation, is nevertheless found in the great majority of cases, and indicates an existing or previous endophthalmitis of the eyes concerned.

In this connection one must not fall into the error of believing that the higher the grade of endophthalmitis the greater the possibility of the sympathetic infection. On the contrary, the more the uvea is destroyed by the endophthalmitic changes the less ground is there for sympathetic ophthalmia. The relative rarity of the latter following panophthalmitis is explained. It must not be forgotten that possibly the endophthalmitis may prepare the soil for sympathetic infection; its organisms may bring about the conditions favorable to the development of sympathetic ophthalmia by symbiosis.

It is self-evident that the endophthalmitis does not possess a striking importance for the condition of sympathetic ophthalmia, that the latter is found even without indication of such; and secondly, that other severe traumatic tissue injuries, i. e., injuries to tissue which are caused only indirectly through trauma, as by hemorrhage into the tissue, traumatic necroses and the like—subconjunctival rupture of the sclera—can form the basis for sympathetic ophthalmia without endophthalmitis. In mild perforating injuries it may well be the endophthalmitis, in severe traumas possibly either the direct or the indirect damage to the tissues.

(b) A second kind of damaging agent competent to bring the uvea into such a condition that it offers the organism of sympathetic ophthalmia suitable opportunity for growth, is found in the well authenticated cases of intraocular sarcoma. In the most of these cases the uvea has previously been the seat of inflammatory changes, which in no sense has anything to do with the sympthetic infiltration. Old membranes show that a severe plastic iridocyclitis has at some time previous taken place and was supposedly brought about by an extensive necrosis of the tumor, or possibly arose from an endogenous bacterial route. In one case Fuchs found indeed no inflammation, but a total necrosis of a large tumor. That in this case a severe insult, perhaps even a necrosis of the uvea, was brought about by the necrosis of the tumor, can not be doubted by anyone who has seen severe injury of all the membranes of the eye caused by necrosis of intraocular sarcomas in other cases. It is perhaps a direct chemical result.

The examples quoted are sufficient for my purposes. In all cases of sympathetic ophthalmia, preceding injury to the tissue of the uvea can be established. Only when the soil has been prepared in this way do the organisms of sympathetic ophthalmia take root.*

I now turn to the discussion of the facts which speak, first of all, in general, for endogenous infection, and perhaps thereby I may adduce facts which add to the probability of endogenous infection of the first eye, even in cases of perforation.

VI.

(1) Since the advance in histologic studies made the diagnosis of sympathetic ophthalmia in the enucleated eye possible, all observers have been to a certain extent surprised that of the numerous eyes removed because of danger of sympathetic ophthalmia, only a small part showed the anatomic findings of a sympathetic inflammation. Thus Fuchs found, in 200 such eyes, 171 in which the anatomic findings of sympathetic inflamation were not present. "I acknowledge," said Fuchs, "that I myself was surprised at the result of my researches. It is possible that other workers on other and perhaps still larger material than my own, will find other results, e. g., that eyes with the typical changes of sympathetic inflammation will be more frequently found without there being in reality any sympathizing inflammation in the other eye. I do not believe, however, that this will be the case to such an extent as to upset the conclusions to which I have come upon the basis of my material." And in his new work on Ophthalmia Sympathica, page 481, Fuchs says: "I repeat my surprise that one does not much more frequently meet the findings of sympathetic inflammation without sympathetic disease. The latter follows sometimes even years after the injury. One must assume that

the process of sympathetic inflamation in the injured eye continues in a chronic manner during this entire time and must be demonstrable in this eye if the eye should be enucleated at any time before the outbreak of sympathetic inflammation. Why does one not, therefore, encounter these findings more often under these conditions?"

Heerfordt sought to avoid this vulnerable point in the theory of ectogenous infection by assuming that late developing cases of the disease arise in consequence of an infection of the primary eye, not at the time of the injury, but only shortly before the outbreak of the sympathetic inflammation in the other eye. For this purpose he assumed that the microorganisms get into the injured eye through the scar. It is evident how constrained this explanation is from the fact that Heerfordt must make the assumption for all cases of sympathetic ophthalmia following subconjunctival scleral puncture, that the microbes, whose presence on the conjunctival mucous membrane is likewise assumed, must be in possession of not insignificant powers of penetration.

All these hypothetical assumptions are unnecessary, and the findings which cause the surprise mentioned are easily understood if one recalls the unquestionable endogenous origin of sympathetic ophthalmia in intraocular sarcoma and considers the possibility of an endogenous infection in these other eyes. Our clinical experience, also, agrees with this theory. All these eyes which we had enucleated on account of danger of sympathetic ophthalmia were not yet, at the time of enucleation, affected by the specific infection, as the anatomic examination demonstrated, but they could have become so affected at any moment. They contained a suitable soil for the development of a sympathetic ophthalmia, which, under circumstances not yet known to us, might have been reached by endogenous means. A second fact, which likewise has been difficult of explanation up to this time on the ectogenous infection basis, is easily understood, namely:

(2) The outbreak of sympathetic inflammation after many years. This fact is difficult to harmonize with the assumption that the disease exciters enter the eye at the time of the injury, since other things convince one that in the presence of typical inflammation in the injured eye the transfer not only almost always results, but indeed results very soon. "For,"

says Fuchs, "if there were wide latitude in this respect one would more often encounter cases with typical findings without sympathetic inflammation." As is well known, Fuchs actually found clinical sympathetic ophthalmia in all the cases in which the eyes showed the histologic picture of sympathetic inflammation. In addition to this is the fact that:

(3) Fresh sympathetic inflammation was found in all of the enucleated primary eyes in which a sympathetic inflammation had broken out in the other eye years later. Concerning this, Fuchs says in his first work, page 420: "I have a number of cases in which a long time, 7, 9, 12 and even, 20 years (in his latest publication one case even 29 years) have passed since the injury. Enucleation had been done, however, not so very long after the outbreak of the sympathetic inflammation; in 3 cases, 4 weeks; in one case, 8 days after the outbreak. In all these cases there were thick old membranes derived from the endophthalmitis which occurred immediately after the injury. Besides this, there existed an entirely fresh sympathetic infiltration. Such cases, where the sympathetic inflammation arises so late after injury, have always had something puzzling about them, and have called forth various hypotheses. All observers agree that one finds in such cases fresh inflammatory foci in the sympathizing eye." Fuchs discusses two possibilities in explanation of this occurrence, i. e., (1) either that the disease exciters brought into the eye through the injury are tolerated by the eye without reaction for a long time, and for this would speak the circumstance that the histologic examination of the exciting eye undertaken some considerable time before the outbreak of the sympathetic inflammation furnishes a negative result so far as sympathetic infiltration is concerned; or (2), that the sympathetic process dates from the injury, indeed persists from that time, and does not go over to the other eye for the sole reason that the infiltration is too small in amount. If the latter supposition were correct, the histologic examination of such an eye must show at any time the characteristic fresh infiltrate of sympathetic inflammation, even though to a limited extent. This is, however, as we have just said, not the case. In spite of this, Fuchs inclines rather to this belief than to the view that the pathogenic organisms remain latent through years.

The outbreak of sympathetic inflammation years after, as well as the fact that entirely fresh infiltration is found in all of these eyes, demands no forced explanation. We have only to turn aside from the idea of an infection through the wound itself and consider the possibility of an endogenous infection. Owing to the accidental presence in the blood of the specific infecting agent, a sympathetic inflammation occurs, and it is a matter of indifference whether it be months or years after the damage to the uveal tissue through the injury, since our experience is that it soon leads to metastasis in the other eye and brings us to the enucleation of the first eye for sympathetic ophthalmia; such an eye must show fresh histologic changes. If we had received the eye for examination some time before, the histologic findings would have been negative, for in this case the infection with the specific organisms would not have taken place at the time of injury.

(4) In the last work of Fuchs on Ophthalmia Sympathica he describes a case in the beginning stage of sympathetic inflammation in which I believe I have found real support, on a histologic basis, for the assumption of endogenous origin of sympathetic inflammation, even in eyes that have suffered a perforating injury. Five days after an injury by an iron splinter, which was removed by a magnet two days after the injury, enucleation had to be performed on account of suppuration within the eye. Upon histologic examination Fuchs found a characteristic inflammation on the surface of the ciliary body and retina constituting a purulent endophthalmitis. The disease of the chorioid consisted of a number of isolated foci about the large and middle-sized veins. The infiltration nowhere extended into the capillary layer. It consisted exclusively of leucocytes, but in many places one saw the destruction of vessel walls and the penetration of cells into the lumen of vessels. Fuchs describes this in his first work as characteristic of sympathetic infiltration. He considers this disease of the chorioid, with the appearance and the localization of the infiltration, to be in all probability the beginning of a sympathetic inflammation, and different from the endophthalmitis existing at the same time in the eye, and finds the following facts worthy of special emphasis: "In the case of endophthalmitis we see the process proceed by continuity. In the sympathetic inflammation present in our case, however, the way

which the toxin has chosen is not manifest, and the manner of the spreading of the sympathetic inflammation is at this time quite as uncertain as is the nature of the exciter." Does not the above described histologic picture of a beginning sympathetic inflammation at once recall the ophthalmoscopic picture of a beginning sympathetic inflammation—the small flecks of the sympathetic chorioiditis? Fuchs himself says he considers the yellow flecks of sympathetic chorioiditis to be the expression of the smallest inflammatory foci in it, entirely like those he demonstrated histologically in the enucleated primary eyes, and of which he has made photographs. Fuchs says, moreover, concerning these flecks: "The homogeneous appearance of the chorioidal foci permits the assumption that these foci have not arisen gradually and in large interstices, but either simultaneously or very soon one after another. Since we clearly have to deal here with precisely isolated foci, the disease has not spread in the chorioid by continuity but the individual foci must have formed independent of each other. Since the injury cannot have come from the outside, from the retina or sclera into the chorioid, no other explanation is feasible than that the toxin has acted through the ciliary vessel system, in which way it could attack the chorioid simultaneously at many points. Miliary tuberculosis arises in a similar manner, and Stock has produced multiple yellow flecks in the chorioid by the injection of tubercle bacilli into the blood stream. Hence this case speaks for the transfer of sympathetic inflammation in a metastatic way."

Can we not transfer almost every word concerning the origin of these isolated foci in the beginning stage of sympathetic ophthalmia and say: The toxin must have acted through the ciliary vessel system and produced the individual foci in the chorioid, i. e., attained the eye in an endogenous way through the blood current, just as later it attains the other eye—whose sound uvea has previously been just as much exposed to the organisms in the blood current as that of the other eye, but could resist them—and, at this later period, is overwhelmed by organisms that have acquired a high-grade pathogenicity in the uvea of the first affected eye, and is destroyed. For the explanation of the disease of the uvea of the second eye, the latter assumption is indispensable, namely, that the organisms developing in the uvea of the first eye become so highly pathogenic that even the sound uvea of the other eye, which they reach by a metastasis, succumbs.

In his first work Fuchs described this peculiar, and up to then, inexplainable manner of spreading the sympathetic inflammation, and gave an exhaustive discussion of it. He found that the infiltration inside the chorioid generally was not a uniform one, but more marked in the posterior segment than in the anterior. The foci are at first isolated, occur mostly back of the ora serrata, and increase in number from before backward. In quite light cases these foci are not confluent, even in the posterior segment of the chorioid, but only lie closer than in the anterior part. The widely known diffuse homogeneous infiltration, then, only arises through the flowing together of these individual foci. Fuchs found this slight participation of the anterior chorioidal zone, even in cases where the part of the ciliary body lying next to a scar following scleral rupture was entirely infiltrated, but that (quite contradictory to the assumption that the inflammation had spread from here by continuity) no real participation of the flat part of the ciliary body and the anterior zone of the chorioid was present, and only found severe disease of the posterior segment.

"In all these cases it is clear that the disease exciters could come over the anterior zone of the chorioid to the posterior zone, and yet the former is much less infiltrated than the latter. One can only assume, therefore, that the anterior zone possesses less inclination to sympathetic infiltration than the posterior." With regard to the insufficient difference of the anatomic character, one must perhaps think of an influence from the variability of the circulation.

If one proceeds on the basis of the possibility of an endogenous infection these findings are explained without difficulty. The organisms borne in by way of the ciliary vessel system have been able to develop most rapidly in the most injured part of the uvea, i. e., in the region of the ciliary body next to the scar, and have—quite analogous to miliary tubercles of the chorioid—developed especially in the posterior segment. Even the fact that the first foci lie in the layer of large vessels and that the small nodules are first found about the veins of the Hallerian layer, and that the choriocapillaris is the least changed—sometimes, indeed, not at all, even when the infiltration has reached a significant extent—even these facts can not be used against the endogenous infection, for we find a similar behavior in the case of the definitely known endogenous miliary tubercles of the chorioid; they also may begin to develop in the choroidea propria and usually occur about a vein. And, according to Dinkler, the inundation with tubercle bacilla is limited to the vessel area supplied by the posterior ciliary arteries, and no spreading—over the district of the numerous other branches of the ophthalmic artery—is to be found.

That which Fuchs has established by histologic research concerning the beginning of sympathetic inflammation in the chorioid has long been known as an ophthalmoscopic finding; and Hirschberg, indeed, in connection with the description of the clinical picture of chorioiditis sympathica, has made the observation that similar findings are present also in the first diseased injured eye. The circumstance that the foci are occasionally first discovered with the ophthalmoscope months after the beginning of the disease is certainly no proof that they have developed late, but only an indication that they were obscured from our vision by the normal pigment layer and only later became visible as yellow flecks through atrophy of it.

5. A further fact, which likewise speaks for endogenous inflammation of the second eye by way of the ciliary vessel system, is that cases of sympathetic inflammation are known in phthisical, first diseased eyes which are absolutely free from irritation. (See the first case of Fuchs' in his work on Ophthalmia sympathica.) Schirmer says, in the *Handbuch*, page 67: "I hesitate to deny the sympathetic nature of the disease. It appears to me an impossibility that an eye which is, indeed, disorganized but entirely free from pain, irritation and inflammation, should induce so severe a process in the second eye." That such cases do occur is a fact. Also it is true that the first diseased eyes show in such cases the characteristic histologic symptoms. The sympathetic nature of the disease can therefore not be denied. Yet such cases are easy to understand by the assumption of an endogenous infection. If, as for the most part generally seems to be the case, the sowing of the organisms at first takes place only in the chorioid, the eye is, to be sure, just as little irritable and painful as with the origin of miliary tubercles of the chorioid or with the sympathetic

inflammation itself so long as it exists only in the form of miliary chorioiditis sympathica and has not yet attacked the ciliary body and iris; certainly a sowing will also result in many cases in the ciliary body and iris, and in this way the irritation symptoms are explainable; these often set in suddenly along with the onset of the sympathetic inflammation in the first eye. If the infection traveled from the scar, the iris and ciliary body would always be involved most extensively, and a painful irritation of the eye be the result.

VII.

I have endeavored to point out in Section VI that many long known facts speak very strongly for the endogenous origin of sympathetic ophthalmia. It now remains to be established that nothing tenable can be brought forth against this assumption. Fuchs asserts in his first article, page 448, that he has never seen the outspoken picture of sympathetic inflammation in any of the preparations from the numerous cases in which less than 14 days had passed after the injury. From this he must conclude that sympathetic inflammation is not even yet recognizable in fresh cases; it would hardly be possible that none of these eyes would ever have been attacked by sympathetic inflammation had they remained indefinitely without enucleation. This observation, therefore, speaks rather for endogenous infection than for infection through the injury itself, since we may well draw the conclusion from the general histologic relationship in sympathetic disease that after two weeks' development characteristic appearances would be present.

In general I would not assert that the organisms never attain the interior of the eye directly through the eye wound; I always speak of an endogenous infection, but I know full well that these organisms may well come into the body through a lesion in the surface of the body or through the mucous membrane, therefore, perhaps at times also through the ocular wound. I believe, however, that this is rather the exception than the rule.

It is interesting that other authors have come by quite other routes to similar conclusions. From observation of a case of sympathetic ophthalmia, Heerfordt came to the opinion that "in this case the sympathetic ophthalmia originated through direct infection of the wound of the perforated eye, and not, therefore, from the inflammation of the latter." He expressed the opinion that his case of sympathetic ophthalmia was not at all of sympathetic origin. That is, it did not originate from a sympathetic inflammation of the injured eye, but was probably excited by microbes which wandered directly into the circulation at the time of injury. One cannot, therefore, avoid the conclusion that "the specific sympathetic uveitis can at times originate from wounds that open blood and lymph passages on other surfaces of the body, which is all the more interesting since it is known that one meets, and indeed not so rarely, uveitides, especially in old women, the character and course of which are similar in every way to sympathetic ophthalmia, but whose origin is throughout obscure."

As already quoted, Roemer holds that the infecting organisms get into the eye through the wound, but concedes the possibility that the organisms occasionally reach the eye and produce an uveitis in another way. The single objection one may quote against the endogenous infection is the sentence of Schirmer's: "One must emphasize the fact that uveal inflammation engendered by an aseptic penetrating splinter never produces sympathetic inflammation." I consider this, however, as unproven.

VIII.

In bringing forth a theory so at variance with the prevailing views of origin of infection in the first eye, it can be readily understood that I would gladly have had the help of authority whose voice has more weight than my own. Yet in spite of the fact that much has been said by various authors about endogenous infection in sympathetic ophthalmia, I am not able to regard these views as support for my theory. The following presentation will make this clear:

In 1898 Th. Leber, together with Krahnstoever, published a work on phthisis bulbi occurring in connection with sarcoma chorioideæ. The work is in many ways interesting in its relation to our theme, and I therefore give some of the important features of it. The authors reported upon 32 cases of phthisis bulbi with previously existing sarcoma of the chorioid, and conclude that this occurrence is relatively rare, since they had brought together the observations recorded in the literature for the 40 years previous. I incline to the belief that this conclusion should not go without further comment, because the majority of eyes with intraocular sarcoma are enucleated before inflammatory changes set in, and that usually the patient comes for operation because of the violent pain incident to beginning increase of pressure or because of the severe pain attending inflammation. The number found can therefore certainly not be utilized to form a judgment as to frequency. In not less than 5 of these 32 cases there occurred an inflammation of the other eye which must be looked upon as a sympathetic ophthalmia. To this must be added two further cases (Laurence and Hirschberg), which Leber and Krahnstoever excluded from their statistics only because no phthisis bulbi was present, although a hypotonia already indicated the transition over into it. In these seven cases an iridectomy, thereby affording the possibility of an ectogenous infectoin, had been performed in only one case (Laurence). "In all other cases recourse must be had to the theory of an endogenous infection." There are still seven other cases of chorioidal sarcoma, which for lack of phthisis bulbi are not taken up by Leber in the statistics, in which a sympathetic ophthalmia has occurred. Yet five of these do not come into the range of our consideration because the possibility of an ectogenous infection following operation or spontaneous perforation must be conceded. Leber and Krahnstoever raise the question in this connection whether one should call the inflammation in the second eye a sympathetic one in these cases. Although the answer to this question is at this time entirely favorable to the histologic diagnosis of a sympathetic ophthalmia—for, as far as the histologic descriptions of these cases go, we have typical sympathetic infiltration—I should like to indicate here the trend of thought taken up by the two authors. They ask whether the inflammation of the second eye is perhaps not to be conceived as something other than sympathetic ophthalmia, something independent of that in the first eye and originating directly in the same endogenous way from the same microbes. "This question is all the more pressing because we almost always have to do here with an endogenous origin of the inflammation in the first eye, and because it is well known that inflammations originating in this way, aside from those of a metastatic suppurative nature, rarely cause sympathetic ophthalmia." Further, they say: "Since in these cases an inflammation of endogenous origin occurs more frequently than does sympathetic inflammation at other times, it is indeed to be inferred that the destroyed tissue of the tumor may afford an especially favorable soil for the development of the microorganisms, and that they become more luxuriant and plentiful than is otherwise the rule after injuries, and that the microbes consequently are not sufficiently weakened through the counteraction of vital forces, but retain sufficient vitality to migrate to the other side." This is only another way of saying that which I deduced in the beginning from other facts, for I pointed out that a tissue injury—traumatic, bacterial, or chemical in nature—is primarily necessary for the development of sympathetic ophthalmia, and, secondly, I assume that the pathogenicity of the organisms becomes so increased in this soil that even the uvea of the other healthy eye can no longer offer resistance to them.

Schirmer, too, accepts Leber's view when he says one must think of an accidental complication in these cases, and for this, an endogenous bacterial infection furnishes the greatest probability. "In the case of complete absence of any perforation, the bacteria can get into the eye only in an endogenous way, supposedly through the blood passages; they develop here in the wide vessels of the tumor, in which the blood current is doubtless retarded, and perhaps also under the influence of chemotaxis." Schirmer, too, held that one must think of an accidental complication in the case of sympathetic ophthalmia following subconjunctival rupture of the bulb, and also of the possibility that we have to deal with an endogenous infection, that bacteria circulating in the blood become delayed in the torn vessels, find conditions favorable to life and spread to the surrounding tissues. When, however, he asserts still that it is always doubtful that the inflammation of the second eye is in reality of sympathetic origin, that it can originate through endogenous infection just the same as the inflammation of the first eye, one can deny this assumption until it is supported by characteristic histologic findings, because we do not know of such endogenous infections with all the characteristic clinical and pathological changes of sympathetic ophthalmia, and healthy eyes are not attacked by it. I must insist, however, that the endogenous infection described by Leber and Schirmer is not identically that of sympathetic ophthalmia. Since we have learned through Fuchs the difference between sympathetic and endophthalmitic disease of the uvea, one can say that the uveitis always spoken of by Leber and Schirmer in the cases of intraocular sarcoma is endophthalmitic. The inspiration for the view that the endophthalmitic uveitis in the cases in question is of bacterial origin comes from the endeavor to prove in all cases of sympathetic ophthalmia that the uveitis of the first eye has originated through a bacterial infection; by this, however, not exactly a "specific infection" apparently is meant. "Since we are of the opinion," says Leber, "that the sympathetic ophthalmia arises through transmigration of microbes to the eye of the other side, we must, even in the case of chorioidal tumors, consider not only the inflammation of the second eye but also that of the first eye as of microbic nature when it comes to the origin of a sympathetic inflammation, and, the analogy leading necessarily to this, must acknowledge this view in general and contend for the same origin of iridocyclitis, even in all other cases of phthisis bulbi with chorioidal sarcoma, where the second eye remains uninvolved."

Without more than remarking that we have here to deal with a disputable conclusion, I think it is a matter of indifference whether in an eye with sarcoma the plastic inflammation originates through endogenous infection, or without cooperation of bacteria, through toxic action following sudden extensive necrosis. For this plastic inflammation, as shown in the case reported by me, has run its course a long time before. It is not this disease which has led to the development of a sympathetic ophthalmia, but it is quite another which is located in the remains of the uveal tissue not yet entirely destroyed by the sarcoma and by the plastic inflammation. There is, certainly, a great difference between the conception of endogenous infection of the first eye, as I advance it for sympathetic inflammation, and the conception of endogenous infection as Leber and Schirmer picture it.

IX.

Cases of intraocular sarcoma and sympathetic infiltration have presented actual difficulty for all authors because they are impressed with the idea of the importance of an injury for the occurrence of a sympathetic inflammation, and such cases are valuable objects for a study of the origin of sympathetic ophthalmia. They represent, likewise, a purer and simpler experiment, employed by nature, than do the cases with perforating injury. They demonstrate the colonization of the organisms specific for sympathetic ophthalmia in the first eye through an endogenous means, and now a whole series of puzzling clinical facts can be brought nearer to our understanding of sympathetic ophthalmia.

In the discussion of the known cases of intraocular sarcoma with sympathizing infiltration I have purposely always referred only to those where every possibility of ectogenous infection was excluded. I do not by any means believe that the other cases, where in consequence of a previous operation or outward perforation of the tumor an ectogenous infection could be drawn into consideration, are simply to be excluded from utilization for the endogenous theory of origin of sympathetic ophthalmia and that everything must be placed to the account of the injury. On the contrary, I think it more correct to say that a new supporting factor for the development of a sympathetic inflammation is added to that of the damage done to the uvea by the tumor when an opening of the bulb occurs, and that the probability of the appearance of sympathetic ophthalmia is greater.

1421 People's Gas Building.

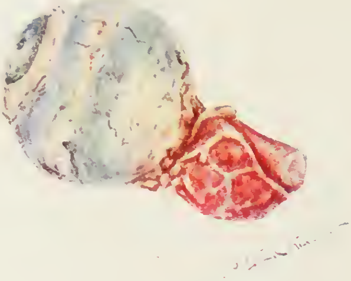

FIG. I—Colored drawing of recently enucleated globe with tumor upon the optic nerve.—(POSEY)

REPORT OF A CASE OF SMALL ROUND CELL SARCOMA OF SHEATH OF OPTIC NERVE.*

WM. CAMPBELL POSEY, M. D.,

PHILADELPHIA.

M. S., female, aged 53 years, consulted me at the Polyclinic Hospital in January, 1909, upon account of a marked prominence of the left eye, which had been present for some two or three weeks. Traumatism was denied, and after prolonged questioning the only factor which appeared likely to be of etiological moment, was an inflammatory condition in her nose, for which she had been under treatment in Dr. F. R. Packard's clinic during a period of some months previously. Dr. Packard was accordingly seen in consultation, and from him I learned that the left middle turbinate had been removed five weeks earlier, on account of a troublesome ethmoiditis. The eye at that time was not prominent and no ocular symptoms were complained of. According to Dr. Packard, the removal of the turbinate had apparently alleviated the nasal condition, for the discharge of a rather copious muco-pus from the cells had been free since the operation and no subjective sensations had been complained of. About two weeks after the procedure, however, the eye-lids upon the same side became puffed and the patient noticed a gradually increasing prominence of the eye-ball. Upon this account, she sought relief in the eye-clinic and came under the immediate care of my assistant, Dr. W. C. Swindells. By that time the forward displacement of the eye-ball had become quite extreme, the lids were greatly swollen and there was marked chemosis of the bulbar conjunctiva. There was no evidence, however, of localizing swelling or hardness of any part of the orbital tissues, the picture being rather that of a diffuse orbital cellulitis. The right eye was unaffected. Left vision equalled 5/20, right, 5/15. Both eyes possessed about 2 D. of hypermetropia. The pupil of the left eye was slightly larger than its fellow and was somewhat sluggish to light, while that of the right eye reacted normally. Both optic nerves were healthy, but the vessels in the left were somewhat tortuous, especially the veins, which were also considerably dilated. The fields of vision were normal, the contraction for form and color which was outlined in the left eye being apparently accounted for by the swelling of the lids.

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*Read before the Section on Ophthalmology, College of Physicians, Philadelphia, April 20, 1911.

As there was no history of syphilis or traumatism, and as an acute sinusitis had been present for some weeks in the ethmoid and probably in the sphenoid cells as well, the orbital inflammation was judged to be secondary to the nasal condition, and an external opening and drainage of the sinuses was decided upon. As transillumination showed evidence of involvement of the left frontal cells, Dr. Packard and I thought it would be well to include these cells also in the operation, and Arnold Knapp's modification of Killian's method was accordingly chosen as the procedure best adapted for the purpose of opening and draining the cells with a minimum amount of scarring.

After etherization, therefore, the frontal, ethmoidal and sphenoidal cells were opened by this method by Dr. Packard and me, both of us working in unison and each assuming the initiative when the technical knowledge of his specialty rendered either one of us the more skillful. No retained pus was found in any of the sinuses, but the mucous membrane was seen to be thickened, and that of the frontal cells had undergone polypoid change. The orbit appeared to be the seat of a diffuse cellulitis, and no area of localized hardness could be palpated. After removal of the mucous membrane from the frontal cells and the establishment of ample drainage from the sinuses into the nose, the wound was closed.

Healing was prompt and the reaction set up in the nasal passages as a consequence of the operation rapidly disappeared. The proptosis, however, persisted, although its degree was lessened for a time by the partial subsidence of the cellulitis. Mercury and potassium iodide were now administered in high doses, without, however, exerting any effect upon the orbital condition. At the expiration of two months of this treatment, the proptosis still persisting and the ophthalmoscopic findings and slowly decreasing vision giving evidence to my mind of the existence of some orbital complication which had been undiscovered by the operation upon the sinuses, a Krönlein procedure was decided upon, with a view to exploration of the apex of the orbit and the removal if possible of the condition which had probably originated and was continuing the exophthalmus.

With the assistance of Drs. Zentmayer and Sweet, my colleagues in the Wills and Polyclinic Hospitals respectively, the external wall of the orbit was resected after the method of Krönlein and the contents of the orbit exposed. As was noted in the previous operation, the entire contents of the orbit seemed to be the seat of a diffuse cellulitis, and palpation could detect no area of localized hardness. The walls of the orbit were smooth. Further dissection of the tissues about the nerve was then essayed, when the finger detected a distinct swelling around the optic nerve, which became thicker and more pronounced directly back of the globe. (Fig. I.) So smooth and uniform was this swelling that it gave the impression of a pyriform dilation of the optic nerve directly posterior to the globe. In addition to this swelling, there was also a distinct mass about the size of a bean up and in from the nerve but not apparently connected with it.

Judging the nerve and the tissues adjoining to be involved in a sarcomatous process, the eye-ball and most of the contents of the orbit were exenterated. The parts concerned in the resection of the external wall of the orbit were then brought into position and the bulbar conjunctiva was united, as after an ordinary enucleation, even though the conjunctiva of the lower lid was considerably infiltrated, as it was thought desirable to provide for an artificial eye later.

Healing was prompt, the orbit slowly filling in with healthy granulations, and the incisions of the Krönlein procedure soon becoming almost obliterated. The subsequent history of the case has been uneventful: there has been no recurrence of the growth, and though an artificial eye cannot be worn on account of the shallowness of the orbit, the deformity caused by the incisions of the Knapp and Krönlein procedures is very slight. The patient appears in the best of health.

The specimens were submitted to Dr. Allen J. Smith, professor of pathology in the University of Pennsylvania, for examination, and his report is as follows:

"Sections examined include one-half the transverse section of the optic nerve, and a growth springing from the sheath of the nerve. The latter in section involves perhaps one-fourth to one-third of the full circumference of the nerve, and at level of sections examined protrudes about 4 mm. outward from the surface of the neural sheath. The nerve section shows no involvement by the tumor, and the inner part of the sheath is intact. The tumor is apparently growing in the outer portion of the sheath, dissecting its fibrous framework apart in such manner that the dense fibrous tissue of the structure forms the general framework of the growth. The tumor has thus developed in a coarse alveolar manner, the fibrous tissue of the outer part of the neural sheath forming the alveolar walls. (Fig. II.) Within these spaces the tumor cells are arranged in a coarse reticular fashion, the reticular spaces being probably lymph spaces. The cells are small round elements, with very little cytoplasm and with relatively large round and oval nulei rich in chromatin. These seem to be adjusted in an intercellular

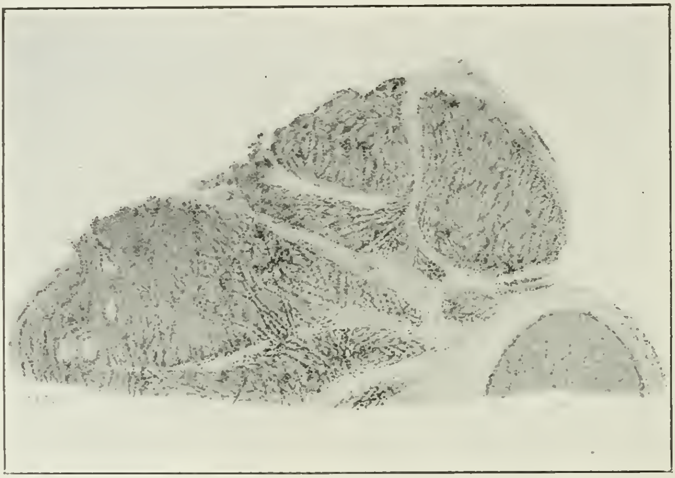

Fig. 2.—Low power drawing showing (a) picture of optic nerve, (b) tumor mass apparently springing from the outer part of optic nerve sheath. The tumor exhibits a coarse alveolated arrangement, the alveolar septa of dense fibrous tissue apparently homogeneous with and extending from the thickened neural sheath; the intraalveolar structure reticular, probably from lymph cleft dilatations, and giving a "reticulate sarcoma" type to the finer structure of the growth.

material which is related with the walls of the lymph spaces above mentioned, and a series of capillaries ramifying in these walls, the endothelium of both the latter structures being evident beneath and among the cells of the tumor. (Fig. III.)

"In the sheath of the nerve apart from the definite growth, the outer portion shows a scant infiltration with cells of the same type as those constituting the growth; and it is believed these represent a definite infiltrative extension; although it is impossible to declare that they may not represent a peripheral inflammatory change. The massiveness of the tumor nodule, the absence of any evidence of organization and the uniformity of character of the cells of the growth all indicate its true neoplastic nature, that of a small round cell sarcoma. The arrangement of the cells in reticulate trabeculæ is probably due to a distension of the lymph spaces by a mechanical edema, but may be taken as a basis for histological classification in the group of so-called 'reticulate sarcomas.'

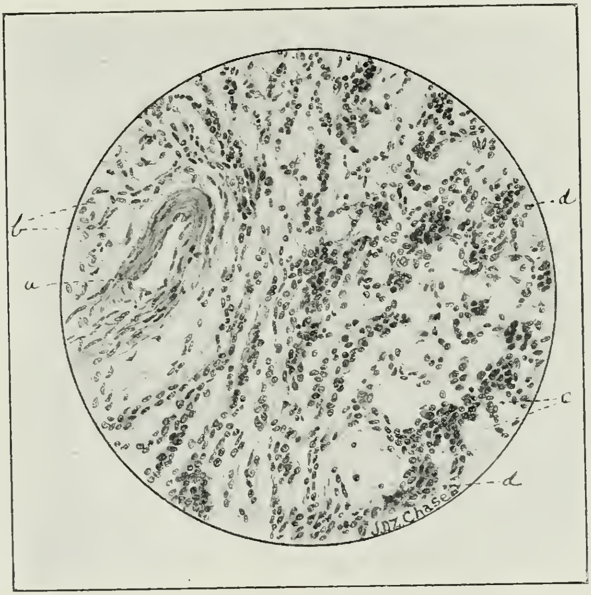

Fig. 3.—High power of growth, showing (a) fully formed blood vessels, (b) lymph vessels, (c) dilated lymph spaces, (d) sarcomatous elements.

"Longitudinal section of the nerve practically duplicates the above description."

The specimens were also examined by Dr. James A. Kelly, pathologist of the Polyclinic Hospital. Dr. Kelly was unable to agree with Prof. Smith's interpretation of the nature of the growth, but considered it to be an infection granuloma, probably secondary to an acute infection in the region of the orbit, or possibly of a specific nature.

According to Parsons, extradural tumors of the optic nerve are rare, indeed up to the time of the publication of his work on pathology (1905), but 18 undoubted cases had been reported. In half of them the disease commenced before the age of 10 years. While proptosis in or about the orbital axis is somewhat characteristic, Parsons cautions that too much stress should not be put upon it as a sign of primary tumor of the optic nerve. With the exception of but one case quoted by this well-known author, the progress of the exophthalmus is extremely slow, spreading over months and years. In none of the 18 cases was the globe implicated directly by the growth. From a careful analysis of the reported cases from a pathological standpoint, Parsons concluded that only 12 were really true examples of primary extradural tumors of the optic nerve, and of these, 9 were almost certainly endotheliomata.

Parsons also states that the rather remarkable similarity in type which extradural tumors exhibit to those of intradural origin, leads him to doubt how far any of these tumors of the latter class really spring from the optic nerve itself, and he proffers the suggestion that in all probability, all, with the exception of the true gliomata, arise from one or other of the nerve-sheaths. He believes, in this connection, that Byers' suggestion of a process of "fibromatosis," comparable to the connection met with in the subcutaneous tissues in elephantiasis affords the best working hypothesis which has been brought forward in explanation of a very difficult class of cases, and says: "The slow growth and relatively low malignancy of these growths, combined with their anatomical peculiarities, demand an explanation different from that of the more malignant growths which we are accustomed to classify as sarcomata. In these respects they are more allied to the infective granulomata, but differ from them in being single, usually free from glandular dissemination and from metastasis. The possibility of a local infection should be borne in mind, and the possibility of parasitic influence has more in its favor in these cases than in the case of carcinomata and sarcomata. It is not, of course, suggested that they are tuberculous or syphilitic in origin, but it is by no means improbable that many so-called endotheliomata, not only in this situation, but elsewhere, are due to parasitic or toxic irritation. The proliferation of endothelium, so marked in these cases, is an anatomical feature bridging over the gulf between many chronic inflammatory conditions and these peculiar tumors."

Twenty-first and Chestnut Sts.

SOME EXPERIENCES WITH THE OPHTHALMO-DIAPHANOSCOPE WITH EXHIBITION OF THE LAMP.*

Howard F. Hansell, M. D.,

Philadelphia.

Twenty-five years ago transillumination of the eye-ball was first attempted. Lange (*Zehender's Monatsb. f. Augenh.*, 1884, p.410) used a beam of light focussed upon the sclera exactly as in oblique illumination, and he was able to distinguish differences in the degree of illumination of the pupil when the light was focussed on various parts of the sclera. The first electric lamp was devised by van Reuss (*Wiener. klin. Wochens.*, 1888, No. 37). Several modifications were suggested by Leber, (Heidelberg Congress 1902), Sachs (*Muench. med. Wochens.*, 1903), and 1906 Würdemann (*Oph. Rec.*, 1906, Vol. 15, p. 513) presented, probably, the most serviceable one. All of the instruments had their limitations and with none of them was it possible to make a conclusive examination of all parts of the eye-ball or of the orbit around and posterior to the ball, until Hertzel, in 1909, introduced his ophthalmo-diaphanoscope. This instrument consists of an 80 candle power electric lamp, strengthened by a reflector, which increases the power of the light to approximately 100 candle power. The lamp is held by the patient far back in his mouth in such a manner that the light is reflected upward in all its intensity. None is emitted below the horizontal line on account of the mirror and paint on the sides and under surface of the lamp. The anterior set of rays passes through the buccal plate of the superior maxillary bone, directly through the antrum and roof of the antrum to the floor of the orbit.

Another set, the posterior, passes through the hard and soft palate, the lateral walls of the nose, the anterior cells of the sphenoid and crosses to the median orbital walls. The eye ground gets its light from behind, below and from the median side. In the normal fundus the nerve head, as with the ophthalmoscope, is the most conspicuous feature. With the ophthalmo-diaphanoscope the nerve head appears more opaque and its surface less transparent than with the ophthalmoscope because the picture is made up of the nerve itself and not only the tissues of its most superficial part. It is sharply outlined from the adjoining fundus, and the pigmentation on its borders is well defined. The retinal veins are dark, almost as they appear in retinal detachment, while the arteries are materially lighter. Hertzel says that all diseases of the eyeground are readily seen, that the instrument is of great value in making a comparison of a healthy and an unhealthy optic nerve in the same individual, and that hemorrhages are especially prominent. Lens opacities appear as with the ophthalmoscope. Foreign bodies in the interior of the eye may be seen and sometimes located. Medicinal dilation of the pupil is not necessary because the miosis which is immediately induced by the light, rapidly disappears.

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*Read before the Section on Ophthalmology, College of Physicians, Philadelphia, April 20, 1911.

I have found that the view of the interior of the eye is facilitated by mydriasis. Hertzel also states that the outcoming rays may be focussed on a screen by a suitable glass or on a sensitive plate for photographing.*

Dr. Hertzel claims that the obstructions in the antrum, anterior sphenoidal cells and frontal sinuses, tumors of the orbit or within the ball, and diseases of the fundus may be positively and instantaneously diagnosed.

In my small experience I am able to say that all these claims, except, perhaps the last, that of clearly seeing the details of the eyeground, are justified. I have been able to see the vessels and the nerve head with tolerable distinctness but with less satisfaction than with the ophthalmoscope.

CASE I. Brought by Dr. LeFever. A young woman with the local signs of orbital tumor well marked. The eye was proptosed fully 25 mm. dislocated downward and outward. Rotations well performed; vision good; diplopia; slight intermittent pain. The illumination of the sinuses was clear and there was no obstruction to the light as it passed around and through the ball. Diagnosis: No orbital tumor.

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*Hertzel. Deutsch. med. Wochens., 1908, No. 22 and No. 49, and Berliner klin. Wochens., 1908, No. 24 and No. 47.

CASE II. Patient of the Jefferson Hospital Out-Patient Eye Department. A man aged 40 complained of partial loss of vision in left eye coming on gradually. The ophthalmoscope showed detachment of the nasal part of the retina commencing about two disk diameters from the nerve head and extending forward as far as could be followed. The surface was smooth, rounded and elevated about 8 D. Transillumination through the orbit showed a diminished reflex in the pupil, and through the nasal part of the sclera a total loss of reflex. The Würdemann transilluminator was also useful in detecting the presence of a growth in the interior of the ball. The advantage of the Hertzel instrument over the Würdemann is manifest in the power it gives one of discovering a growth in the posterior half of the ball, a part not accessible to the Würdemann instrument. Diagnosis: Tumor of the chorioid.

CASE III. Patient sent by Dr. Dercum. A man 39 years old has attacks resembling epilepsy since his eighteenth year which have recently increased in frequency. He has become exceedingly nervous, hands and body tremble, he has nodding of the head, and his mind is at times unbalanced. Right optic disk pallid, the retinal veins slightly overfilled; left disk also pallid but less than right. The ophthalmo-diaphanoscope showed imperfect transmission of light through the floor of the right orbit. In the absence of sphenoidal disease the obstruction was believed to be due to a thickening from periostitis of the floor of the orbit on the right side. The orbital lesion is probably only a part of the morbid process involving other cranial bones. It may be that other cases of slowly advancing optic atrophy, the causes of which have remained obscure, may have a similar etiology. The diagnosis of the cranial disorder of which optic atrophy as a symptom is difficult and uncertain, and any aid such as is furnished by the Hertzel light should be warmly welcomed.

CASE IV. Mrs. F., aged 31, a subject of headaches for many years. She has had the eyes carefully and repeatedly refracted without benefit except that she has been able to read with less discomfort. Curiously enough, she had an entire cessation of the pain, which always commenced over the left eye and extended from there to all parts of the head, while the accommodation was paralyzed, to return in all its violence and frequency after the effect of the cycoplegic, homatropin or duboisin, had passed away. Recently her suffering could be relieved only by morphia in large amounts. The light showed imperfect illumination of the left frontal sinus, a finding confirmed by radiographs. The front view was that of a partly undeveloped or partly occluded sinus. Dr. Francis R. Packard, who has also had the patient under observation for a number of months, is inclined to believe the headaches are due to chronic inflammation in the sinus, and has suggested the performance of an exploratory operation. In this patient the transilluminator revealed exactly the same condition as the X-ray.

CASE V. Miss B., sent by Dr. deSchweintz, gave the following history: Two months before, the right eye became proptosed with great loss of vision and some pain. Under potassium iodide and mercury the exophthalmos diminished and the ball regained motion which had been greatly restricted, particularly outward. The first symptom of which the patient complained was a partial loss of vision in the left eye, lasting about one week. The eye was never proptosed. The diaphanoscope showed absolutely clear orbits and sinuses. The findings were entirely negative—although most of the local signs of tumor of the orbit were present, neither the X-ray or the transilluminator confirmed this diagnosis. I have understood from Dr. deSchweinitz that all symptoms of tumor have disappeared and the vision completely restored by medicinal measures without operation.

CASE VI. Dr. S., injection and edema of both conjunctiva of a few days standing, associated with a similar condition of the mucous membrane of the nose and throat. The two main symptoms were mouth breathing and constant frontal headache. The antrum and orbital cavities were well illuminated but the frontal sinus on both sides almost entirely excluded the light rays. Diagnosis: Catarrhal inflammation of, and collection of exudation material in the frontal sinus.

CASE VII. John D. Gradual loss of vision with preservation of light perception only in a limited section of the fields from optic nerve atrophy. Transillumination of all the accessory cavities was perfect, indicating that the cause of the atrophy was not anterior to the brain.

This patient presented a marked contrast to Case III in the degree of illumination of the orbits. In that case the imperfect illumination pointed to disease of the orbital walls.

A valuable contribution to the clinical utilization of the ophthalmo-diaphanoscope by Langenhan has been published in the *Zeit. f. Augenh.*, August and December, 1910. He lays especial stress on its superiority in the differential diagnosis between the ordinary serous detachment of the retina and the detachment of chorioidal tumor. He says that in contrast to the uniform red color of the diseased retinal area, solid tumors appear as nontransilluminable black configurations on the red fundus. In speaking of the picture of medullated nerve fibres he says the diaphanoscope picture demonstrates the very opaque qualities of the medullated fibers in the living eye. The enlargement of Mariotte's blind spot thus receives a sufficient physiological and physical explanation in the very slight transparency of the fibres and does not require the supposition of rudimentary development of the retina in the area of the fibres.

He concludes: Diaphanoscope is not only of theoretical interest, but deserves to be recognized as a new method of examination of practical value. (Abst. *Ophthalmology,* April, 1911.)

My own conclusions are: The light is invaluable in the diagnosis of orbital tumors; thickening of the walls of the orbit; and in growths in the posterior half of the eyeball, and it is of the greatest aid in the transillumination of the anterior cells of the sphenoid, the ethmoid and of the antrum.

I have had no experience with other portions of the body, but believe as Hertzel says the instrument is useful in many pelvic disorders.

1528 Walnut Street.

THE STRABISMUS HOOK—A USEFUL INSTRUMENT IN EXTIRPATION OF THE LACRIMAL SAC.*

EDWARD A. SHUMWAY, M. D.,

PHILADELPHIA.

Various methods have been suggested for outlining the lacrimal sac, during its extirpation. The most prominent of these have been the injection of melted paraffin, which congeals at a higher temperature than that of the body, or of cold paraffin, which requires a special injector such as Broeckaert's, or the one shown by Borsch at the meeting of the American Medical Association, in Atlantic City, in 1907. According to Baird (*Ophthalmic Surgery,* 1910), Dr. Fullenwider of the Illinois Eye and Ear Infirmary, has proposed the use of fine dental plaster, made into a thin emulsion with sterilized water, to which a little salt is added. Dr. C. R. Holmes of Cincinnati uses a thick paste of starch colored with iodin, and Valude of Paris recommends spermaceti. These substances are injected through the punctum, and care must be taken lest too great force be used, and the material break through the sac walls into the surrounding tissues, and thus complicate the subsequent dissection. Jocqs of Paris makes an opening into the anterior wall, as soon as the sac is exposed, and packs the organ with absorbent cotton.

Most of these methods, however; are bothersome, require specific apparatus, and in the case of the melted paraffin, may delay the operation by the time required for the paraffin to congeal. It has been my custom, after making the skin incision, and carefully dissecting through the layers of superficial fascia and muscle, to pass a probe through the duct, in order to make certain of the position of the sac. This necessitates the removal of the Müller wound speculum, and the probe cannot be left in position, when the speculum is replaced. During the past six months, instead of the probe I have used a strabismus hook, and have found it an exceedingly helpful instrument. As a rule, in the operations which are done for chronic suppuration or mucocele of the sac, and these are the most frequent indications, the canaliculus has been slit previously, so that an ordinary strabismus hook can be inserted without difficulty. If the canaliculus is not slit, a small Stevens' hook will pass through it, if the punctum is dilated. Having been passed into the sac, the hook is turned so that the point is directed upward, and it may be readily felt in the wound by the finger, as it raises forward the anterior wall of the sac. With the instrument in place, the handle extending across the lower lid, as shown by the accompanying sketch by Mrs. Chase, there is no difficulty in re-inserting the speculum, and no distortion of the tissues in the area of operation. With the projecting point constantly in view, the position of the sac is

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*Read before the Section on Ophthalmology, College of Physicians, Philadelphia, April 20, 1911.

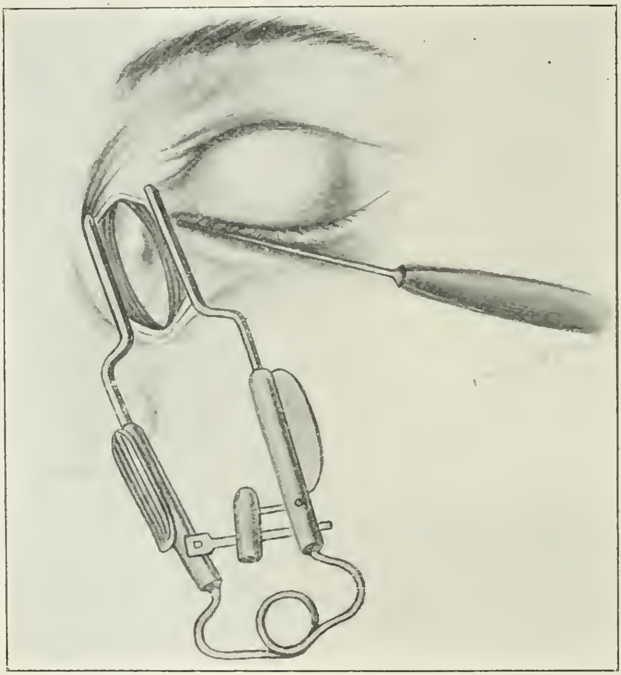


Fig. 1.—Strabismus hook, introduced through canaliculus into the lacrimal sac, to show the position of the sac.

readily determined, and the hook need not be removed until the sac is raised from its bed, and the operator is ready to cut it off above and below. The method is simple, does not delay the operation, requires no special instruments or injecting materials, and has made the operation much easier for me to perform.

Another instrument which has proved of value in dissecting out the sac is a Graefe cataract knife, the point of which has been ground off, leaving a rounded end, the blade being about 20 mm. long. The cutting edge is used for making incisions, the back of the blade for dry dissection, and when the sac is well isolated, the blunt end is inserted into the lacrimal fossa, and the sac separated from its attachments to the periosteum on either side, so that it can be drawn forward with a pair of forceps into the wound. With the same knife, or with a pair of curved scissors the sac is then cut first above from the canaliculi, and below at its entrance into the bony canal, and after curettement of the bony canal, and insertion of the skin sutures, the operation is completed. The ease with which I have been able to locate the sac, with the strabismus hook inserted, in the operations that I have done recently, and the satisfaction which Dr. deSchweinitz has expressed in his trial of the method, have made me think it worth while to suggest it to the members of the Section.

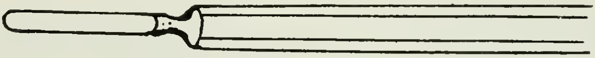


Fig. 2.—Graefe cataract knife, with point ground off, for dissecting out lacrimal sac.

2007 Chestnut Street.

REPORT OF A CASE OF OPTIC ATROPHY WITH HORIZONTAL HETERONYMOUS HEMIANOPIA.

J. W. Sherer, M. D.,

Kansas City, Mo.

Woman, aged 50. Applied for treatment Nov. 12th, 1910, complaining chiefly of failing vision and severe headache. The vision first became noticeably dim 5 years ago and the headache has been very bad for at least 20 years. She has passed through eight pregnancies. Three births were "still." One infant lived 15 months. One daughter, aged 16, is not strong. The other three children are in fairly good health.

For about 15 years, from the age of 20 to the age of 35, she suffered severely from gastric trouble, which culminated in a severe hemorrhage from the stomach. From this she made a good recovery. When about 30 years old she suffered for some months from acute articular rheumatism with considerable fever. This was cured she thinks by a change of residence and occupation. She removed from the city flat and went to live on a farm where she performed the usual duties incident to life on a farm, and rapidly recovered from the rheumatism and has had no return of it since.

When she first applied to me for treatment she said she was suffering terribly from headache, and had not been free from headache for 20 years. For the last five years the sight has been failing and was becoming so poor that it was difficult for her to get around, and impossible for her to do any near work.

Visual tests showed:

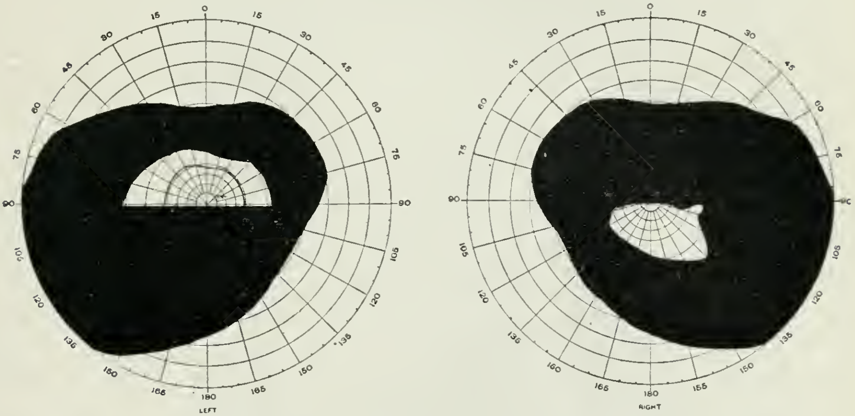
V. R. E. = 1/60. This eye sees the lower half of any object only.

V. L. E. = 6/15. This eye sees the upper half of any object only.

Measuring the visual fields showed the results depicted upon the accompanying field charts. Both fields are much contracted, and the right eye has a lower half field for form, black and white only.

The visual field of the left eye shows a contracted upper half field slightly larger than that of the right eye and retaining the color blue. Yellow, red and green are extinct. The extinct upper half field of the right eye includes the fixation point, the macula, and consequently this eye has eccentric fixation only.

In the left eye the horizontal dividing line between the preserved and lost half fields is 3 or 4 degrees from the macula in favor of the seeing half of the retina. The pupils are normally reactive to light. The intraocular tension is normal in each eye. There are no symptoms of glaucoma. The media are clear in each eye. Each disk looks grayish and atrophic and there is about as much excavation of the disks as would occur in optic atrophy.



Horizontal Heteronymous Hemianopsia. Field O. D. is for form only, there being no color perception. V=1/60, eccentric fixation. Field O. S. is for form and blue. Yellow, red and green are absent. V=6/9 central fixation.

The visual fields present the condition of horizontal heteronymous hemianopia. The pathological condition is evidently that of optic atrophy and the etiology specific. The patient has progressed nicely on increasing doses of iodide of potassium. She is now taking 25 grains three times a day. The right eye does not show any improvement but the left eye has improved from 6/15 to 6/9. The headaches have disappeared, and the patient feels better in every way than before in many years.

(Apropos of the above case is a case of bilateral inferior hemianopia reported by Uhthoff. He supposed it to be due to symmetrical disease of the optic nerves. It occurred in a patient suffering from tabes dorsalis.)

418 Argyle Building.

A CASE OF CHANCRE OF THE EYELID, WITH A DEMONSTRATION OF THE SPIROCHAETA PALLIDA.*

William T. Shoemaker, M. D.,

Philadelphia.

CASE. Married woman, 30 years of age; seen in the Eye Clinic of the German Hospital for the first time November 14, 1910. One week before, she noticed swelling of glands in front of her right ear and beneath the lower jaw, same side, shortly after which she experienced slight irritation in the inner corner of the right eye. This irritation was caused by what she describes as a small elevation resembling a pimple. It was then, and has remained since without actual pain, although it causes considerable annoyance. The appearances when she came to the hospital were almost exactly those of a hordeolum at the inner angle of the upper lid, and it was so diagnosed and treated in spite of the enlarged preauricular glands. Only when it selected a course entirely different from hordeolum were my suspicions aroused, and within a few days thereafter, the development of a surrounding ring or wall of marked induration, with a more or less glazed and indolent looking central area, made the clinical diagnosis of chancre easy.

The case was at once referred in consultation to Dr. A. A. Uhle and Dr. W. H. MacKinney, who found the spirochæta pallida, and who have kindly consented to come here this evening and demonstrate it to those interested.

The lesion has spread somewhat and now involves both lids at their junction. The eyeball has not suffered beyond a slight injection, and there is very little ocular disturbance beyond the area of the lesion. The swollen glands are typical in that they remain without pain and show no tendency to suppurate. The source of the infection, whether immediate or mediate, cannot be determined in this case, but inasmuch as the patient's husband has always been generous to a fault in presenting her with venereal diseases, it is probably immediate.

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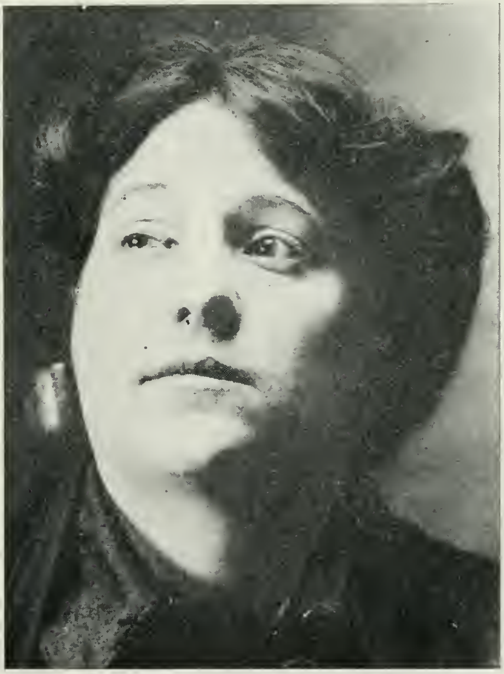
*Read before the Section on Ophthalmology, College of Physicians, Philadelphia.

A chancre is an all too common lesion and is the same wherever found. Furthermore, there is no part of the body having blood vessels, less receptive than any other part, providing the spirochætæ gain entrance. My object, therefore, in showing this case is merely to remind those handling numbers of patients, that extra-genital chancres make their appearance when and where least expected, and seldom declare themselves before there has been abundance of opportunity for the physician to contract syphilis insontium through careless manipulation, inadvertence, etc.



Chancre of Eyelid.

"Hard Chancre of the Eyelids and Conjunctiva" is the subject of a valuable monograph written by David DeBeck in 1886, and "Syphilis in the Innocent," by L. Duncan Bulkley, is an essay for which was awarded the Alvarenga Prize of the College of Physicians in 1891.

Both DeBeck and Bulkley have been so careful in the preparation of their statistics that their findings are probably as accurate to-day as they were 20 or 25 years ago. Bukley tabulates from a number of observers 7,123 cases of chancre, of which 6,770 were genital or perigenital, and 353 were extra-genital. Of the extra-genital, 7 were on the eyelids. The percentage of extra-genital lesions according to these figures is almost 5, but inasmuch as these statistics were taken mostly from venereal clinics, and do not include great numbers of innocent inoculations happening in foundling asylums and special clinics, Bulkley thinks that the extra-genital lesions would possibly form more than 10 per cent. of the whole. He gives an interesting "*Table of Localization of Extra-genital Chancres,*" made from the reports from most all civilized countries. Of 9,058 extra-genital lesions thus classified, 372 or over 4 per cent. were of the eyelids and conjunctiva. These structures were the fifth in point of frequency affected.

The modes of infection are of course as various as the possibilities for placing the spirochæta in contact with the eye. Bulkley mentions from his series a few, now well known and often referred to. Several cases were in physicians and midwives who conveyed the poison to the eye by means of the fingers; in two instances, physicians received the infection from patients coughing in the face. In a considerable number, the chancre was given in an attempt to remove foreign bodies from the eye with the tongue of a syphilitic. Under *Epidemic Syphilis* (Epidemic No. 104) Bulkley cites the instance of a female practitioner in a Russian town in 1886 who caused an epidemic of lid and conjunctival chancre in her efforts to remove foreign bodies from the eye and cure trachoma. She was, however, a martyr, as she had contracted the disease herself from a patient upon whom she was practicing her ophthalmology. Sixty-eight cases, thirty-four direct infections resulted from this lady's efforts.

That syphilis insontium is not many times more prevalent than it is, is probably due to the fact which I learned from Dr. Uhle that the spirochæta lives under favorable circumstances but a few hours (perhaps 4 or 5), and while it is marvelous what can be accomplished in such a short lifetime, fancy the possible results were the spirochæta as viable as the tubercle bacillus.

109 S. Twentieth Street.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(UNITED STATES OF AMERICA.)

BY

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PHILADELPHIA.

OSCAR WILKINSON, M. D.,

WASHINGTON.

AND

ARTHUR F. AMADON, M. D.,

BOSTON.

The Increasing Frequency of Inherited Syphilis and the Grave Importance of Its Early Recognition in Infants and Young Children from the Standpoint of the Ophthalmologist.

BULL, CHARLES STEDMAN, New York (*Medical Record*, January 7, 1911), considers that the gravest and most serious consequences of syphilis are those due to heredity. In cases of inherited ocular syphilis the lesions are often so ill defined that they can be detected only by the closest observation. For this reason the examination should begin at the birth of a child and be repeated at regular intervals. Such an examination would help materially in determining what proportion of these cases is of fœtal origin.

Ocular lesions may be confined to the lids and conjunctivæ or corneæ, or may involve the deeper structures of the eye.

Lesions of the uveal tract are often not recognized at birth because their development is not looked for until the first half year of life. The lesion may involve both eyes and is apt to recur.

Uveitis in infants may seriously involve the retina, but later in child life this is not so apt to occur. Retinitis due to inherited syphilis in infants and young children usually leads to permanent changes in the retina, these changes varying from faint white lines along the smaller arterial branches to entire obliteration of the vessels. Optic neuritis in these patients may end in partial or complete atrophy.

Careful examination for syphilitic stigmata may reveal a slight deformity in the pupillary margin or irregularity in the shape of the cornea, the latter of the oval type. Interstitial keratitis and a vertically oval cornea may be coincident and may exist in one or both eyes, but this malformation of the cornea alone should not be considered as proof of inherited syphilis. O. W.

Ocular Signs Frequently Assocated with Vaso-Motor Disturbances.

HANSELL, HOWARD F., Philadelphia (*Ophthalmology*, October, 1910), says that the ocular signs referred to are not structural and depend upon causes not connected with the function of sight, but rather with the activity of the sympathetic or autonomic nervous system, and are probably due to abnormal action of the unstriped muscular tissue of the lids and orbit and of that in the coats of the blood-vessels. Vaso-motor instability is a fundamental condition from which many of the so-called specific diseases arise, and while the symptoms are not constant they occur in association so often that they may be said to indicate the affection. The collective eye signs here mentioned include those pointing to both irritation and relaxation of the sympathetic system and may be explained by disturbed function of the unstriped muscular fibers in the orbit which modify both the voluntary muscles and the calibre of the blood vessels. The ocular signs of vaso-motor ataxia are: 1. Venous hyperæmia of the retina, the diagnosis of which is difficult. Pulsation of the veins, contrast between the color of the arteries and veins, an excessive amount of deficiency of chorioidal pigment, may be physiological as concerns the eyes, but pathological as an indication of systemic disturbance.

Almost invariably the writer has found tortuosity and a slight increase in the diameter of the veins, most noticeable in the largest veins. The cause of the dilatation of the veins is uncertain, but it is doubtless associated with systemic vascular disturbance elsewhere. 2. Stelwag's sign, or a permanent increase in the vertical diameter of the commissure, with or without enlargement of the thyroid glands. 3. Graefe's sign, or the lagging of the lid as the ball is rotated downward, and not due to the mechanical obstruction of a more or less protuberant ball. Both this and the preceding sign may be either unilateral or bilateral, persistent or intermittent. Both these signs are also seen in connection with Graves' disease, which is regarded as a combination of glandular and nervous disturbance. 4. Tremulousness of the lids, which is less commonly seen, is binocular, more marked in the lower lids, and developed when the lids are lightly closed. 5. Pigmentation of the skin of the lids. 6. Pupillary inequalities. In determining the presence and importance of these ocular signs we must consider the refraction and health of the patient and remember that the eye signs are significant and dependable only in the absence of local causes.

A. F. A.

Arterial Hypertension and Its Relation to Morbid Changes in the Eye.

Peter, Luther C., Philadelphia (*Ophthalmology*, April, 1911), says that it is becoming more evident that arterial hypertension is a premonitory sign of chronic interstitial nephritis and general arteriosclerosis and is much increased after these diseases are well established. Retinal hemorrhage, retinal œdema and neuroretinitis have a more or less direct relation between the height of the tension and the severity of the symptoms observed. Chronic interstitial nephritis is generally associated with a generalized arteriosclerosis, both being due to a common cause, and hypertension, as a rule, is a premonitory symptom. The two conditions are commonly merged and that is particularly emphasized in the eye phenomena; in fact, we may say that arterial hypertension is the chief cause of the eye ground phenomena observed in chronic interstitial nephritis and arteriosclerosis. Klatz has demonstrated that hypertension may cause arteriosclerosis, without a toxic element. It is not improbable that spasm or ataxia of a retinal artery or branch, causing temporary blindness, may be caused by hypertension in the young, where it cannot be demonstrated, as we know is the case in the old, where we can demonstrate sclerosis of the blood vessel walls. This condition is also probably associated with hemorrhage following cataract extraction and subconjunctival hemorrhage. In the limited number of cases of glaucoma which the author has examined he has failed to find one case in which the blood pressure was not increased. In order to prevent the more serious eye conditions and to treat rationally, routine blood pressure studies should be made in all cases of intraocular disease, not traumatic in origin. A. F. A.

The Relationship of the So-Called Trachoma Bodies to Conjunctival Affections.

NOGUCHI, HYDEYO, and COHEN, MARTIN (*Archives of Ophthalmology*, January, 1911). In the study set forth Dr. Noguchi personally examined over 10,000 smears and sections in the following conditions:

1st. Normal conjunctiva of the new-born (white).
2nd. Normal conjunctiva of the new-born (colored).
3d. Conjunctivitis catarrhalis (acuta).
4th. Conjunctivitis catarrhalis (chronica).
5th. Conjunctivitis associated with measles, scarlatina and diphtheria.
6th. Conjunctivitis, due to foreign bodies on the conjunctiva or cornea.
7th. Conjunctivitis, due to atropine.
8th. Conjunctivitis vernalis.
9th. Folliculosis conjunctivæ.
11th. Trachoma
  hypertrophic or granular
  cicatricial
  acute type, or mixed infections.
12th. Blenorrhœa neonatorum gonorrhoica.
13th. Blenorrhœa neonatorum non-gonorrhoica.
14th. Blenorrhœa gonorrhoica in adults.
15th. Blenorrhœa gonorrhoica in children.

After an exhaustive study of these classes of cases the writers conclude:

1. The uniform absence of the so-called trachoma bodies in the first nine groups of cases disproves the theory that the

bodies are merely the result of local irritation, be it mechanical, chemical, inflammatory, or toxic.

2. The absence of the bodies in all but nine of the 250 cases of conjunctivitis follicularis shows that they are rarely associated with this disease.

3. The frequent but inconstant presence of these bodies in trachoma, blenorrhœa neonatorum non-gonorrhoica and blenorrhœa gonorrhoica in children, is an associated phenomenon whose exact etiological significance in these diseases remains to be solved by future investigations. The finding of the bodies in the conditions mentioned above suggests to the writers the hypothesis that the so-called trachoma bodies represent an etiological factor in an independent conjunctival affection which is not complicated by pannus or cicatrization and which clinically resembles trachoma with acute manifestations or the pupillary stage of blenorrhœa gonorrhoica. On this hypothesis the presence of the so-called bodies in trachoma and in blenorrhœa gonorrhoica is to be interpreted as the result of the engrafting of the disease caused by these bodies on the original affection. H. G. G.

Trachoma.

Brown, Samuel Horton, Philadelphia (*New York Medical Journal*, April 1, 1911), gives a historical account of trachoma and concludes that it is an infectious, contagious disease, of chronic nature, attended by most disastrous results to vision, and practically incurable. The fact that a few recent cases in persons under the best surroundings have promptly responded to treatment should not be taken to invalidate this statement.

The only effective means of treating the condition is by refusal of admittance of infected patients to noninfected communities or countries.

Trachoma as it exists in America, and especially in Philadelphia, at the present writing, is a most attenuated form of the disease, particularly in the native born individual. These cases are of no greater importance than a host of ocular conditions, and while necessitating treatment do not call for isolation and segregation.

Trachoma cases with discharge, in America, are more dangerous than those without, but no more dangerous than any other discharging ocular affection, and not so much so as some.

In American cities, all "groups" of adults and children should be subjected to routine ocular examinations at regular intervals in order to detect new foci of the disease, but this does not imply that these patients should be subjected to rigorous quarantine measures. The disease is essentially chronic, and years may elapse before deformities occur, and the hardship quarantine thereby entails is obvious. Operative measures are unsatisfactory. Applications that lessen the discharge serve to retard the disease and make the patient comfortable.

M. L. F.

Soft Fibroma of the Conjunctiva.

Wyler, Jesse S. (*Ophthalmic Record*, February, 1911). A woman, aged 43, was in an hospital being treated for rheumatism when she complained of scratching in her right eye. Examination revealed, beneath the lower lid, a pink nodule extending from the conjunctiva just below the tarsal cartilage and somewhat to the inner angle. The mass was soft, firmly attached, and bled on manipulation. A linear knife plunged into the tumor caused it to bleed profusely but did not reduce the size; curetting also failed to remove any part of it. One-third of the mass was removed with a scissors, but this did not tend towards improving the condition. Several days later the entire mass was removed by means of a scalpel and scissors, and the conjunctival wound closed with two silk sutures. Perfect healing followed in a few days. Subsequent examination of the tumor showed it to be a fibroma of unmixed variety.

O. W.

A Preliminary Report on the Treatment of Scleritis and Pterygium.

Carpenter, E. R. (*Ophthalmic Record*, March, 1911), experimenting with subconjunctival injections of various substances in cases of scleritis and pterygium, found that pure tincture of iodine injected over the region involved would clear up the condition in a short time. He has used this in many cases with perfect results. In two cases of specific origin the small pterygium disappeared after the iodine treatment. The use of the iodine was preceded by a five per cent. injection of cocaine, and followed by applications of ice for several hours.

O. W.

Report of Case of Infection Following Cataract Extraction Treated by Vaccines, with Rapid Recovery.

O'Connor, R. P., Fort Screven, Ga. (*Ophthalmology*, April, 1911), reports a case in which four days after the usual operation for the removal of cataractous lens, which was uncomplicated and promptly closed without prolapse of iris, infection developed and progressed in spite of the usual treatment. A vaccine was made from the pus and at first injected subconjunctivally without improvement, but two days later it was injected into the arm, following which improvement was rapid. After four doses the eye had cleared up satisfactorily. The improvement was so immediate and continuous as to seem like a clear case of cause and effect. A. F. A.

A Fatal Case of Dementia Following Cataract Extraction.

Hill, Emory (*Ophthalmic Record*, February, 1911), reports the case of a woman aged 72 on whom Dr. Posey, Philadelphia, performed a combined cataract extraction on the right eye. The operation was successful and the condition of the patient satisfactory in every way until the fifth day after the operation when she refused food and medicine. She became mildly delirious. During the following forty-eight hours she was given sedatives at intervals. Her physical and mental condition becoming worse she was removed to the Philadelphia Hospital, where she died eight days later. During the entire period of delirium she appeared to be happy, there was no symptom of fear or violence. O. W.

Recurrent Tubercular Chorioiditis.

Koller, Carl, New York (*Ophthalmology*, October, 1910), says that doubtless many cases of tubercular chorioiditis have heretofore been classified as syphilitic, and that our classification has been faulty in that the location and grouping, instead of the etiology, have been at the basis of our classification.

Tubercle of the chorioid may be found at any stage of the disease and when no other generalized infection can be found. The histories of three cases are given in full to illustrate the essential characteristics of the disease. While tubercular infection cannot be proved in any of the cases, unless the reaction to the second injection in Case II may be held as proof in that case, the lesions may be considered tubercular because of the prevalence of tubercular lesions generally, the ophthalmoscopic identity of the foci with tubercles in the known acute cases, the finding of bacilli in the aqueous in one authentic case, the local reaction to the diagnostic injection of tuberculin in another, and the well known pathologic characteristics of the chronic tubercular process. The foci in the chronic tubercular type have a characteristic distribution. They occur singly or as a confluent group or chain of foci in one region and they are monocular. Case I: Mrs. K., 28 years old, in perfect general health, complained of seeing a black spot before her right eye. Examination showed opacities of the vitreous, and two atrophic chorioidal patches below, in the periphery. Three years later she again complained of visual disturbance but otherwise was in perfect health. Vitreous opacities were found as before, the nerve was œdematous and the borders hazy, and directly below the nerve and a few diameters distant was a chain of four chorioidal foci, two old and two new ones. The new foci were non-vascular, had a clear, pearl gray color, were raised above the chorioidal surface and were about one-third as large as the disk. They abut the older foci and are almost confluent with them. The old patches appeared much like any old atrophic patches. Later, the new patches developed a narrow, yellowish, halo-like border zone. Case II: Mr. G., 23 years old, in perfect health, complained of black spots before the left eye and impaired vision of that eye for the last four or five days. Precipitates were found on Descemet's membrane, the optic nerve was swollen, the outlines obliterated, and about five diameters from the nerve a whitish, chorioidal exudate was seen, and a few small hemorrhages and a little pigment surrounding the focus. Later, opacities of the vitreous appeared, the swelling subsided, a pigmented border appeared, and the patch began to cicatrize. Eight months later, visual disturbances again appeared, and near the border of the old patch was to be seen a new focus and over it the surface was elevated five or six diopters. The papilla was markedly swollen. A diagnostic injection produced no reaction, but a week later a larger dose was given (1 mg.), which was followed by marked alteration in the condition of the eye. There were new opacities in the vitreous, and the color of the swollen area changed from grayish fawn to purple gray. Six weeks later the condition had improved, leaving an elevated area over the chorioidal atrophied patches. Case III: Mrs. L., 20 years old, presented just above the macula, an old atrophic patch of chorioiditis, and at the edge of this a small fresh focus just appearing. This went through the same changes and process of involution as the previous cases. A. F. A.

Syphilitic Disease of the Chorioid Treated by Sodium Cacodylate.

Bull, C. S. (*Medical Record*, January 14, 1911), reports three cases. The first was of inherited syphilis, the patient being nine years old. There was peripheral chorioiditis, myopia and astigmatism. Vision was reduced to light perception, and the vitreous was filled with exudation. Mercury and iodide of potassium had been used for three months without effect. One-tenth of a gram of sodium cacodylate was injected and was repeated at intervals of two days until three injections had been given. There was improvement in vision after the first injection, and on the ninth day vision had risen to 20/70, and the vitreous had become clear.

The second case was a man aged 32 who had had a severe course of mercury and iodide of potassium for fourteen months. Vision was reduced to counting fingers, and the vitreous was filled with opacities. After three injections of sodium cacodylate given at intervals of three days the opacities disappeared, vision had improved and pain ceased. Three weeks after the first injection vision was 20/30 plus.

In the third case, a man aged 27, there was gumma of the upper lid and of the sclera of the right eye which had lasted for three months. After four injections of sodium cacodylate the gumma of the lid was absorbed, and that of the sclera, which was more obstinate, had become softer and smaller.

O. W.

The Extractum Corporis Ciliaris in the Tretment of Sympathetic Ophthalmia, with a Report of Two Cases.

Heckel, Edward B., Pittsburg (*Ophthalmology*, April, 1911), reports two cases of sympathetic ophthalmia in which he made use of subconjunctival injection of extract corporis ciliaris every other day for three months with no appreciable result. A. F A.

A Case of Sarcoma of the Optic Disk.

Murray, G. D., Scranton (*Ophthalmology*, October, 1910), reports a case of tumor, pearly gray in color and spherical in shape, exactly overlying the papilla and apparently pedunculated, which on removal proved to be a small spindle celled sarcoma of the optic nerve. A. F. A.

Incipient Glaucoma, Its Diagnosis and Treatment.

Bradburne, Alison A., Southport, England (*Ophthalmology*, April, 1911), emphasizes the fact that glaucoma is not a disease, but a condition, and that in its treatment we should direct our attention more to the cause of the increased tension than to the tension itself. This condition arises from a disturbance in the equilibrium between the process of secretion and excretion of the fluids of the eye. Often, in the early stages, neither increased tension nor cupped disk can be demonstrated, the former because the increased tension may be temporary and variable and perhaps lessened by the methods adopted for the examination, and the latter because it is the terminal result of more or less long continued hypertension. Occasionally a seemingly typical cupped disk may be seen with no other evidence of glaucoma, and well developed glaucoma may be found without this condition becoming manifest. In fact, it often happens that the only suspicious symptom is the complaint of some disturbance in the vision, of a fleeting, temporary nature and we must look for the other results of increased tension in order to make a diagnosis at an early period, when treatment can be of most value. Often the only complaint is an inability to read without a stronger lens. Therefore it becomes essential that we should be fully conversant with the prodromal warnings and acquire a knowledge of the alterations which hypertension can produce on the various structures of the eye. These are briefly: 1. The cornea and sclera will suffer from circulatory œdema. The cornea will be hazy, causing dimness of vision, glimmering and halos. This will be difficult to see in many early cases. The changes in the sclera, except in the very young, will be scarcely noticeable. But there is one clinical feature of great value. This is the relatively small size of the cornea—a feature of great value in those predisposed to glaucoma.

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2. Upon the uveal tract the tension will affect the blood supply and nerves and thus impair vision, dilate the pupil by paralyzing the sphincter and weaken the ciliary nerves and so impair accommodation. 3. Impairment of the transparency of the transparent media of the eye. 4. The direct effect of pressure on the retina will produce atrophy, manifesting itself by the fading of the bright color of the retina, particularly at the edge of the disk, where a yellowish ring will often be noticed. This, when present, is of more value in early diagnosis than cupping and is often present when the latter is absent. Pulsation of the arteries, particularly near the disk, is a sign of the greatest value. This may often be developed by gently pressing upon the eye with the finger. In true glaucomatous cupping the vessels pass over the edge of the disk in close apposition to the margin, are also flattened against the sides and then disappear behind, to come into view again deeper down on the pressed back floor—the lamina cribrosa—of the disk. In depressed disk of atrophic nerves the vessels hug into the atrophic cupping and are not pressed or flattened and broadened out against the edge of the disk, and do not disappear behind the disk margin as in glaucoma. The optic canal being formed of sheathless nerves, on account of their unyielding nature the width of this channel will afford the earliest signs of glaucoma. Later its depth will become affected. It is the "reaming out" of this channel, the flattening of the nerve elements against the sides which form the essential guides in estimating doubtful cases. It is far more important to estimate the increase of the area of excavation than any increase of depth, as it not only occurs earlier and is of more practical value, but its detection is easier. As the nerve fibers which supply the periphery of the retina have the longest distance to traverse and are therefore more exposed to pressure, the interference with their function will be first and more noticeably manifested at the periphery of the field of vision, and this portion should be most carefully examined. Nearly always a triangle of defect will be found when no other definite sign will be obtained. This test is also of value in differentiating between glaucoma and optic atrophy simulating glaucoma. In the latter the color fields are not affected till late, whereas in atrophy they disappear early. If one succeeds in making an early diagnosis before structural changes are too pro-

nounced and before vision has been interfered with too much, medical or surgical treatment will be of much avail and may retard destructive changes for a long time, though a perfect cure is probably yet to be obtained. Depletion by the use of dionin, freeing the angle of filtration by myotics, dilating and freeing the channels of egress by gentle massage upon the center of the cornea, and various other medicinal procedures designed to reduce the tension are of much value if used early. Sclerotomy and peripheral iridectomy are in many cases preferable, particularly if too firm a cicatrix does not block the angle instead of freeing it. A. F. A.

The Operation of Simple Trephining of the Sclera for the Relief of Glaucoma.

Elliot, R. H., Madras, India (*Ophthalmology,* April, 1911), says that while von Graefe's operation for the relief of glaucoma by iridectomy is suited to a certain class of cases, some points of advantage may be claimed for the method of securing a permanent filtering cicatrix by trephining the sclera. The method in use at Madras is as follows: The patient is prepared as for surgical operations generally, the engorgement of the eye is relieved by local applications, eserin is instilled, and the conjunctiva is rendered as thoroughly aseptic as possible by irrigation and swabbing. A general anæsthetic is used only if necessary. A large triangular flap is dissected from the conjunctiva above the cornea, the attached base of the triangle lying at the sclero-corneal margin, close up to the limbal attachment of the conjunctiva, so as to ensure the trephine entering the anterior chamber directly; this is the pivot-point of the whole procedure. The spot selected for trephining should be as close to the limbus as possible. The object before the operator is to enter, tap and drain the anterior chamber with the absolute minimum of disturbance to other structures; a clean hole through the sclera satisfies these conditions. In Madras the Bowman trephine has been used, making an opening of 1.5 mm. to 2 mm. diameter. If the iris presents in the opening it is slit radially, which allows the aqueous to escape and the iris often recedes but if it does not a piece is excised. It is seldom necessary to employ a suture to keep the flap in place. A drop of eserin is used after the operation if needed, but on the third day atropin solution is used unless the pupil is already widely dilated and active. While complications have been met with, still the results have been good. It is not only clear that we can reduce intraocular tension at the time, but further, that the filtration established shows every sign of being permanent. A. F. A.

A Case of Varix or Angioma Venosum of the Orbit.

KLINEDINST, JOHN FERDINAND, York, Pa. (*Ophthalmology*, April, 1911), reports a case of varix of the orbit in which the lower lid became swollen by a bluish mass whenever the patient leaned over or tilted the head toward that side and which disappeared in a few minutes after the erect position of the head was resumed. Electric acupuncture produced no improvement and injections of from three to six drops of alcohol once a week were made along the floor of the orbit with the result that the tumor became smaller and at length entirely disappeared. It is probable that a mild cellulitis was developed, followed by a thrombophlebitis and organization of the clot, with obliteration of the veins. The advantage which alcohol has over other drugs in this procedure is that it, if injected into a vessel, will product an albuminous clot that is soluble in the blood current and therefore would do less damage if carried into the cavernous sinus. A. F. A.

Enlargement of the Blind Spot, an Early Symptom in the Diagnosis of Optic Nerve Affections, Due to Disease of the Posterior Nasal Accessory Sinuses.

VAN DER HOEVE, J., Utrecht (*Archives of Ophthalmology*, January, 1911), described a case one year ago of disease of the posterior nasal accessory sinuses, in which the first symptom of the resultant optic nerve affection was an enlargement of the blind spot, and has since been in a position to examine six more cases of the same condition, which histories he sets forth in his text. Dividing his paper into two parts he concludes that: 1. In cases of nasal disease, where there is doubt whether the posterior accessory sinuses are involved, it is necessary to examine for scotomata of the blind spot, for white and colors. 2. Enlargement of the blind spot for white and colors points with great probability to disease of the posterior nasal accessory sinuses, and justifies operative interference for this disease, if there are no other causes for the presence of the peripapillary scotoma. 3. Early treatment of the posterior accessory sinus disease can cure the resultant optic nerve affection. In his second class his conclusions are: 1. There is a peripapillary nerve fibre bundle, which may be the first portion of the nerve to be involved in retrobulbar neuritis. This is shown by enlargement of the blind spot for white and colors. 2. Enlargement of the blind spot occurs in almost every case of disease of the posterior nasal accessory sinuses. 3. In retrobulbar neuritis, the papillo-macular and peripapillary fibres are usually affected alone, or long before the remaining fibres of the nerve. 4. In sympathetic ophthalmia, the papillo-macular and peripapillary fibres may become involved. It is of the greatest importance to study this further, because this symptom, if it were often found, would be of great value for the prognosis and therapy of sympathetic ophthalmia. H. G. G.

The Relation of the Anterior Ethmoid Region to Diseases of the Eyes.

Dowling, J. Ivimey, Albany (*Ophthalmology*, April, 1911), says that there is abundant clinical evidence of the intimate relation between the anterior ethmoid region and the eyes, and a close relation can be demonstrated anatomically. The paths of invasion are contiguity of tissues, blood and lymph streams and nerve communications, more particularly through the nasal nerve, the septal branch of which supplies the anterior part of the septum, the external branch the anterior portion of the middle and inferior turbinated bodies and the mucous membranes of the outer nasal wall, the branch to the lenticular ganglion, the long ciliary nerves and the infratrochlear nerve. Ten case histories are given to illustrate the value of removing the anterior portion of the middle turbinates for the relief of ocular irritation and inflammation in suitably selected cases. A. F. A.

A Case of Anisometropia.

O'Connor, R. P. (*Ophthalmic Record*, February, 1911), met with a case of anisometropia in a woman aged 49, a teacher of drawing, who complained of not being able to see well enough to continue her work. She was cross-eyed, and had been so for 25 years, using the right eye for near, and the left for distant vision. It being doubtful that correction would give her binocular vision, two operations were performed on the left eye, viz., a central tenotomy of the internus and an advancement of the externus. The eye was kept bandaged for twelve days. At that time the phorometer showed 2½ esophoria with glasses. She had binocular vision of 20/15 with distant correction, and the addition of + 2 S. enabled her to read fine type. Six months later the esophoria was 8° at 20 feet, and 3° at reading distance, but notwithstanding this she was wearing her glasses with perfect comfort. O. W.

Telescope Eyeglasses.

SCOTT, KENNETH, London, England (*Ophthalmology,* April, 1911), calls attention to a modified form of telescope eyeglasses for the relief of high degrees of myopia, which are less ungainly in appearance than those which were originally devised in Germany. The heavy framework has been entirely eliminated and the front and back lenses are in contact at their edges and enclose an air space between their opposing surfaces. A. F. A.

Bilateral Partial Tenotomy, with a Greek Cross Test Object for Use During Operation.

ZIEGLER, S. LEWIS, Philadelphia (*Ophthalmology,* April, 1911), calls attention to the value of partial or graduated tenotomy in the correction of the lesser errors of balance of the horizontal and vertical muscles of the eye. Since graduated tenotomy was developed and practiced by von Graefe in 1861 it has been modified in some details but remains essentially as he left it. Complete tenotomy is undoubtedly indicated in the more marked cases of muscular deviation, especially of the horizontal muscles, while partial tenotomy is particularly applicable to vertical errors of low degree as well as affording a method of great accuracy in the correction of all errors. Several methods and locations for the cut have been suggested, but either bilateral or central cuts seem to involve less chance of torsion than a cut upon either edge of the tendon. The method adopted by the writer has the following essential features: A complete division of each lateral third, a careful clipping of the superficial fibres in the central third, a testing of the result by means of an illuminated Creek cross at six meters, and a further weakening of the median fibres, if necessary, until sufficient elongation has been secured. Adventitious fibres in the conjunctiva or capsule may interfere with the result, and if so they must be found and severed. It is necessary to carry the eye to orthophoria or 1/2° beyond in the case of the vertical muscles, and to 1° beyond orthophoria in the case of the horizontal muscles. In tenotomy of the vertical muscles the immediate corrective effect a half hour after operation will be essentially the ultimate result. In operation on the vertical muscles, while it is theoretically better to operate on the superior rectus, practically it is better to cut the inferior rectus, because it is more accessible and because it is less likely to bleed. A. F. A.

A Critical Study of the Ocular Asymmetry of the Formosan Savage.

OLIVER, CHARLES A., Philadelphia. (*Ophthalmology*, October, 1910), observes, from the study of many photographs of a large number of Formosan savages, several points of asymmetry, among them being a tendency of the right supraorbital ridge to an upward and outward deviation, the left eyeball was somewhat higher and more deeply set than the right in most cases, the right eyeball was nearer the median line, the corneæ and pupils were oval and directed downward and inward from the vertical meridians, the palpebral fissure was generally shorter and narrower on the right side, the commissural angles inclined some five to ten degrees down and in from the horizontal meridian. A. F. A.

Some Impressions of Certain Eye Affections of the Negro, as Compared with the White Man.

MINOR, JAMES L., Memphis (*Ophthalmology*), reports that in most respects the errors of refraction and of muscular anomalies are much less frequent among the negroes than among the whites, and, on the other hand, glaucoma is more frequently seen and probably trachoma also, while the gonorrhœal ophthalmias and iritis are far less severe. A. F. A.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(GREAT BRITAIN AND THE ENGLISH COLONIES.)

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The Operative Management of Atypical Cataracts (Juvenile, Non-Senile.)

FRIDENBERG, PERCY (*The Ophthalmoscope,* April, 1911,), believes that most operators are agreed as to the best method of extracting a senile cataract after the older methods, but adds "The impression is general and well founded that extraction-in-the-capsule, in its present form, is too hazardous to be universally applied On the other hand in the treatment of atypical forms of cataract a marked divergence of theory and practice is noted. No definite method of procedure or systematic teaching is conveyed by text books or teachers in ophthalmology." Under the head of atypical cataracts the author includes all forms except senile cataracts and divides them into the following named groups,—the congenital cataracts of zonular, polar, or purely nucleocortical type; juvenile cataracts; and traumatic cataracts. Diabetic, lenticular sclerosis, and such special forms usually seen in middle life, as glassblower's cataract, are excluded. The factors of immaturity, constitutional disease, refraction, and capsular anomalies are also excluded as belonging more properly to the senile group. The lens in high mypoia, as it affects children and young adults, is included as a borderline case.

The small corneal incision employed in linear extraction together with free irrigation of capsule and anterior chamber has greatly increased the efficiency of the operation. The former by minimizing the cases of loss of vitreous, the latter by removing the most common source of irritation.

Excepting traumatic cataracts the author considers first "the question of what we expect to accomplish, the possible improvement in vision, appearance, and consequent social and industrial benefit to the patient, and, then, the method or methods by which we may expect to accomplish our object."

The following operative procedure is advocated: General anesthesia for children and young adults whom we cannot count on as being tractable and pensive. Intelligent patients, according to the author, may be put to rest physically and mentally, by the administration of a hypodermic injection of morphine 1/4 grain, and hyoscine 1/150 grain, an hour before operation, or subconjunctival injection of 1/2% to 2% solution of cocaine.

Full dilatation of the pupil is essential. If unable to accomplish this before operation the synechiæ should be freed by the use of a cystotome or de Wecker's scissors. The keratome incision is made about one-half of the way, from the limbus to the horizontal meridian of the cornea. Capsulotomy should be free and peripheral. Irrigation with normal salt solution through a small glass pipette is employed until the anterior chamber is perfectly free or until the operator is convinced that irrigation alone will bring out nothing more. A drop of 2 or 3 per cent atropine solution is instilled and bandage applied. The author disclaims any originality.

Zonular or Lamellar Cataract.—A single needling is rarely adequate to cause opacification and homogeneity sufficient to allow extraction by a flap incision, and the author believes they should be operated after the linear method of extraction.

W. R. P.

Concerning Congenital Cataract: Comments Upon Sixty-six Cases in the Ohio State School for the Blind.

Brown, John Edwin, Columbus. The report includes 66 cases, 44 males and 22 females, operated upon during the last fifteen years at the Ohio State School for the Blind. Sixteen of the cases gave history of consanguinity.

"In twenty-seven of the sixty-six admissions, operations had been performed on one or both eyes before admission to the school. Of those that entered with both eyes unoperated, twenty-two have since had operations at the school.

We can use these groups for purposes of comparing visual power:

(1) Visual rating of unoperated cases.

(2) Visual rating of those operated before entrance, which, it may fairly be presumed, means operated at an average younger age than those

(3) Operated after entrance to the school.

In these groups we tabulate eyes rather than patients. As can be expected, where opacity of media exists, where there is imperfect development of the neuroretinal tract—probably ametropia—nystagmus, squint, and more marked amblyopia of one eye are frequent. The wide variation in degree of visual acuity may be supported, therefore, in the same patient by a fair degree of vision in one eye, and bare P. L., or slightly better, in the other."

The visual rating of the seventy-five cases unoperated was as follows: In sixty-one the vision was less than 10/200; in thirty cases, it was more than light perception; 97% were unable to read.

Visual rating of the eyes operated before entering the school, fifty-five in number, two had a vision of 20/70 and two cases with better vision enabling the eye to be used for reading; 92% were not able to read ordinary printing. Of those operated on at the school, thirty-three in number, only two are as low as perception of light while one is 20/70; eight have ability with more or less difficulty to read ordinary print.

The author does not agree with the idea that we should operate early on congenital cataracts to prevent amblyopia of high degree and to stimulate retinal activity. There has been nothing in his personal experience to make him feel that the age of the patient at the time of operation had anything in particular to do with the result obtained. The degree of vision secured when the pupillary space was freed, depended upon conditions of the nerve and retina which obtained from the beginning. The ultimate vision from cases operated on at the age of six, eight or ten gave as good results as those operated at the age of one, two or three years. The author is governed by the degree of vision in the eye in determining the time for operation. If there was a dense opacity, involving the whole lens, and vision was p. l. only, he operates one eye at least before the age of three years and if a good result was obtained, the other also. If failure follows first operation, he waits until the child is of age sufficient not to, at least, interfere with the measures to be carried out, even if not able to co-operate.

If the opacity was less extensive or dense, so that there was somewhat better than f. v., and the child thus enabled to get about and to use this vision in play, he waits until the sixth or seventh year before operating. In institution work, where parents or friends may be more ready to criticise failures than in private work, he usually chooses the poorer eye for first operation, and allows the patient or pupil to decide as to whether the second eye was to be operated if no benefit was secured from first operation.

Rarely are the conditions such that an iridectomy will give good results.

In the posterior polar, peri-nuclear and zonular opacities, the anterior capsule does not present the problem that it does in the forms where the opacity involves the anterior capsule itself. In these latter cases following descission and absorption of the lens, there is generally a marked tendency to proliferation of cells with a resultant dense pupillary membrane. If the calcareous pyramid is found attached to the capsule at the anterior pole of the lens, the result of descission is nil. Such a membrane is exceedingly difficult to extract or to lacerate. Often repeated attempts at laceration or extraction are made before the pupil is clear. To obviate this possibility, the author lacerates the capsule freely, a mydriatic having been previously used, and breaks up not only the cortical but the nuclear lens as well and follows by a linear extraction, using capsule forceps if need be, to remove the anterior capsule.

In conclusion, he says he is positive that in a large number of cases operated upon over five years of age, there will be fewer total failures than in a similar number operated upon under that age. W. R. P.

Smith's Cataract Operation.

Greene, D. W. (*The Ophthalmoscope,* April, 1901), lays stress on the relative size of the cornea and lens, believing that a knowledge of these proportions and relationship of one part of the eye to the other has more to do indirectly with the success or failure of the operation than all other causes combined.

In the examination of 600 cases, the average horizontal diameter of the cornea was about 11¾ mm. The average diameter of a number of lenses just removed from the same class of men was 8¾ mm. The lens seems not to vary as much in diameter as the cornea. A small cornea therefore is a contraindication to extraction in the capsule "as the lens would be pinched and squeezed to a dangerous degree in expressing it."

After describing the operation as done by Smith in 1908, the author calls attention to some modifications he has made in the instruments as originally used by Smith. He (Greene) has also discontinued the use of a 1/2000 bichloride solution from a glass container suspended five feet above the operating table, substituting the Ziegler flushing bottle containing normal salt solution. He says he has seen as severe cases of panophthalmitis in Jullunder as he ever saw at home.

The author gives a detailed description of the various steps in the operation and analyzes some of the adverse reports of results as observed by others. He believes the great field of usefulness of the Smith operation will ultimately be found in the immature cataract. W. R. P.

Lantern Demonstration of the Unmodified "Smith" Operation for Cataract.

Vail, Derrick T. (*The Ophthalmoscope,* April, 1911) describes the operation as done by Major Smith, illustrating each step by drawings or photographs—thirty-seven illustrations in all. In conclusion, the author states that "the results were uniformly good as regards visual results, and good as regards cosmetic results." W. R. P.

A Case of Cataract from an Electric Shock.

Grimsdale, H. and James, R. R. (*Ophthalmoscope,* May, 1911). A case of cataract following an electric shock is reported. An engine-driver, aged 40, while on top of his engine received an electric shock, either his cap or ear coming into contact with a live wire overhead. He was rendered unconscious and received severe burns of the right ear, cheek, nose, and sole of right foot, the boot of which was bursted and scorched. The burns healed slowly, but two months following the injury, a blurring of vision was noticed of the right eye. Examination showed a good deal of fine stippling on the anterior cortex of the right lens, arranged roughly in a ring leaving the central and peripheral zones comparatively clear. The left lens showed beginning involvement of a similar nature. Fundi negative.

The opacity of the lenses increased and one year from date of injury a simple extraction was performed on the right eye. The lens was rather sticky and some soft cortical matter remained behind, which necessitated dividing later before good vision was obtained. The ultimate result was good, a vision of 6/5 obtaining with proper correction.

Cases of cataract following electric shock have been reported by Brixa, Desbrieres and Bargy, Ellett, Dor, Komoto, Bichelonne, and Dollen. W. R. P.

On the Oculomotor Type of Polioencephalitis.

STEPHENSON, SYDNEY (*Ophthalmoscope*, March, 1911). A group of cases is discussed, the chief characteristic of which is the sudden onset of paralytic squint at an age when squint is not altogether common. Twenty-eight cases were collected, in which the condition arose without obvious cause in some, in others following scarlet fever, measles, an injury, a fright or some trifling operation. The child, often in apparently good health, awakens from sleep presenting a squint, which has not been noticed before.

The writer believes from his observations that the oculomotor symptoms in these cases depend upon an acute focal encephalitis, quite analogous with the better known forms of that disease.

The following points are taken up in an analysis of the twenty-eight cases: (1) sex; (2) age when seen; (3) age of onset; (4) the influence of other illnesses; (5) the associated signs and symptoms; and (6) the nature of the oculo-motor manifestations.

1. Sex apparently has no particular determining influence upon the incidence of the disease.

2. Age when seen varied from three months to thirty years, the average in months being 78.8.

3. Age of onset ranged from shortly after birth to 4½ years, the average being 19.1 months. Fifty per cent of the cases began in the first year of life. In a series of 1,017 cases of unilateral convergent squint tabulated by Worth only 13.17 per cent began in the first year of life.

4. Other illnesses.—In 53.57 per cent of the cases the squint was immediately preceded by some condition that might possibly have been the cause of the brain mischief.

5. Associated signs and symptoms.—In 67.85 per cent of the cases the squint was not preceded, accompanied or followed by any disturbance of the general health of a sufficiently pronounced nature to impress the memory of the parents. One patient developed a paralysis of one external rectus muscle following circumcision, and six years later the right leg became paralyzed, apparently from acute anterior polio-myelitis.

6. Any of the extrinsic muscles of the eyeball, either singly or in combination, may be attacked, although in three-quarters of the cases the external rectus alone was affected. Paresis was more common than paralysis.

The diagnosis is simple except in those cases where the external rectus alone is affected, but that occurs in three out of four cases.

In marked cases, when the child is old enough to follow a bright object, a defect may be found in the outward rotation of the squinting eye, but more commonly it will merely fall short of that accomplished by the sound eye. In milder cases there may be only a lack of smoothness in the lateral excursions of the eyeball—"the eye drags." Conclusive evidence is furnished by an examination of the tiny bright images reflected from the corneæ when a candle is held before the eyes, the bright spot of light will occupy approximately the center of the cornea of the unaffected eye, while in the other it will be displaced in a direction opposite to that of the squint. The degree of secondary deviation is also valuable, as in ordinary concomitant strabismus the primary and secondary deviations are equal, while in paralytic, such as that due to encephalitis, that is no longer the case. To distinguish from the congenital paralyses, the history is the sole dependent.

CONCLUSIONS.

1. There is a particular form of paralytic strabismus in children which is due to polio-encephalitis.

2. It is not uncommon, and is most frequent in children under one year of age.

3. It is associated comparatively seldom with other symptoms indicative of a cerebral disorder.

4. Zymotic diseases appear to be important factors in its causation.

5. Although the paralyses may affect any of the extrinsic muscles of the eyeball, yet in three-fourths of the cases the external rectus is alone involved. The intrinsic musculature of the eye is seldom attacked.

6. The common or encephalic strabismus is very apt to be confused with the ordinary form of concomitant convergent strabismus. W. R. P.

On the Relation of the Meningococcus Intracellularis to Pseudoglioma.

Coats, George and Forbes, J. Graham (*Ophthalmoscope*, May, 1911). The authors present four cases of pseudoglioma in which an organism indistinguishable from the meningococcus intracellularis was found, without any of the associated symptoms of meningitis.

Case I. There occurred a simultaneous onset, without constitutional symptoms, of metastatic ophthalmitis and arthritis of the left wrist-joint. No history of specific infectious disease. Temporary improvement of the ocular symptoms under treatment, followed by retrogression. Excision. Primary seat of metastasis the retina. Meningococci recovered from the vitreous.

Case II. Metastatic ophthalmitis first noticed a week after the onset of arthritis in the left wrist-joint. No history of specific infectious disease. Perforation of the globe at the equator. Excision. Metastatic retinitis. Meningococci in the vitreous.

Case III. Metastatic ophthalmitis of the right eye following measles. Eyes buphthalmic. Excision of right. Metastatic retinitis. Gram-negative diplococci with the morphological characters of the meningococcus found in the vicinity of the retina at the equator.

Case IV. Metastatic ophthalmitis of the right eye following the onset of measles at an interval of a fortnight. Excision. Probably metastatic retinitis and chorioiditis. Gram-negative diplococci morphologically similar to the meningococcus in the vitreous and subretinal space.

In the first two cases an organism identical in appearance, staining reaction and cultural characteristics was found. In the vitreous of the other two cases an organism similar in morphological and staining peculiarities was found, and although no cultures were available there was little doubt but that the organism was the same in all four cases. (None of the cases showed symptoms of cerebro-spinal meningitis).

The writers believe that a specific causal relation may be established between the meningococcus and pseudo-glioma, basing their opinion upon having found the organism in four cases of metastatic ophthalmitis of pseudo-gliomatous type and upon the following considerations:

(a) Pseudo-glioma is a well defined clinical entity, and is therefore not unlikely to be due always to the same organism.

(b) A form of ophthalmitis identical with pseudo-glioma occurs in from four to five per cent of cases of epidemic cerebro-spinal meningitis; the meningococcus having been recovered from the eye in such cases.

Pseudo-glioma and cerebro-spinal meningitis are both diseases of childhood and both are sometimes associated with arthritis.

(c) In idiopathic pseudo-glioma a history of head symptoms, probably due to meningitis, is very frequent; two of the cases prove that even where the history is not of head symptoms, but of measles, the pseudo-glioma may still be due to the meningococcus. W. R. P.

Inherited Syphilis and Blue Sclerotics.

Rolleston, J. D. (*Ophthalmoscope*, May, 1911) reports a case of blue sclerotics in a child born of syphilitic parents. When three weeks old the child had lost the power of the left arm but had recovered without treatment. Upon entrance to the hospital the infant presented an atrophic appearance, constantly crying, marked prominence of the scalp veins, bulging forehead, and umbilical and right inguinal hernia.

Both sclerotics showed a uniform pale-blue coloration, irides gray. embryontoxon at margin of each cornea. The blue coloration was more obvious some days than others.

The mother, aged 27 years, presented an almost identical condition of the sclerotics, and stated that her sister and grandmother also were similarly affected. Two brothers were not affected.

The child was put on mercuric treatment, but two months later developed a spontaneous fracture of the left humerus at the junction of the upper and middle thirds. The iinet united after splinting and increasing the dose of mercury.

The condition of blue sclerotics as a congenital disease was first described by von Ammon in 1841, but it was not until 1908 that the hereditary transmission was first mentioned when Peters of Rostock recorded cases in four generations. In 1910 Sydney Stephenson described the condition affecting twenty-one out of thirty-two members, belonging to four generations of one family, the inheritance being through the females. Bishop Harmon subsequently added another generation, bringing the total to thirty-one blue sclerotics out of fifty-five members.

One other case reported by Eddowes was accompanied by pathological fracture of the child's humerus, although syphilis was not suspected.

Eddowes suggested that the transparency of the sclerotics indicated a want of quantity or quality in the fibrous tissue forming the framework of the various organs of the body.

W. R. P.

Intermittent Word-Blindness.

PRITCHARD, ERIC (*Ophthalmoscope*, March, 1911). The following case of congenital—word and letter—blindness is of extreme interest because of the intermittent or recurrent character of its manifestations, a peculiarity which the writer was unable to find described in other cases.

An intelligent boy, 8 1/2 years of age, attending a London elementary school, was below the normal standard for his age. Wholly due to the fact that he could not learn visual reading. He learns quickly by ear, and with the exception of a memory for letters or words has a good visual memory as well. He will recognize at once even a badly drawn picture of a cup or bat or dog, but if one writes the letters c, u, p, he will not recognize any of them nor their significance. Upon repeated testing he failed to give the correct answer for more than one or two letters in the alphabet, which he probably guessed at. At times he will not only recognize all the letters, but can read quite intelligently. These lucid moments occur perhaps once or twice a week.

He has so good a memory for words spoken, that it is often very difficult to differentiate between a parrot-like repetition of whole pages of his reading book and an intelligent reading of the same.

Most of the cases of anomalies of speech are due to a congenital defect involving one or more of the following nerve-centers:

1. Auditory word-center—word-deafness.
2. Visual speech-center—word-blindness.
3. Motor speech-center—idioglossia.
4. Motor writing-center—agraphia.

The whole character of the condition cited appears to be allied to neurasthenia or psycho-asthenia, and it seems as it, while the constituent neuronic elements of his visual word-center were normal in structure, there was some defect at the synapses, which link up these memories with the processes of cells in closely associated nerve centers. W. R. P.

Some Inflammatory Eye Conditions Due to Oral Sepsis.

Goulden, Chas. (*Ophthalmoscope*, March, 1911), has attempted to show from the ophthalmic surgeon's point of view, that the mouth may be a source of infection, in all probability the cause of a large number of inflammations of the iris and ciliary bodies not attributable to syphilis or gonorrhea.

A series of thirty-nine cases were studied, five of iritis, twenty-one of iridocyclitis, four of anterior vitreous opacities, eight of chorioiditis and one of panophthalmitis. Of the twenty-one iridocyclitis cases, sixteen were of the class variously labelled "plastic iritis," "rheumatic iritis," "gouty iritis," all most difficult to treat in contrast to those due to syphilis and most of the gonorrheal cases which respond well to treatment. One case presented septic foci in the tonsils. In two cases no cause could be discovered, possibly in the uterus. In thirteen cases sepsis in connection with the teeth was present, in many of which the improvement was so marked as to leave little doubt of their relation. Two cases are mentioned illustrative of the etiologic relation of oral sepsis to iridocyclitis. The first case was accompanied by an effusion into each knee joint, suggesting the probability of rheumatism as the causative factor. Rapid improvement followed the removal of the septic root of a right upper molar, although the inflammation had been markedly severe. The other case was an iridocyclitis of two years' standing which had been considered of a tuberculous nature. Removal of several septic teeth which were in a very bad state, resulted in steady improvement, a small yellowish mass below at the angle of the anterior chamber of the right eye rapidly disappearing.

The other cases revealed foci in the nose, stomach and teeth. Two of the chorioiditis cases also were due to a septic condition of the teeth.

In conclusion a case is described in which panophthalmitis developed thirty-six hours following the extraction of two teeth after injection of the gum. Septicemia developed and the patient died. The gum was swollen and in a very foul condition. Streptococci pyogenes had been cultivated from a specimen of blood, and the same organism was found in the tissues of the eye. W. R. P.

The Anatomical Relation Between the Sphenoidal Sinus and the Orbit. Observations Upon 100 Skulls.

Francis, L. M., and Gibson, J. A. (*Ophthalmoscope,* March, 1911). The authors present the results of their investigation of the relationship between the orbit and the sphenoidal sinus, which were made upon 100 skulls with the view of determining in an anatomical way, the bearing affections of the latter might have upon the structures protected by the former.

Two anatomical conditions presented themselves:

1. Projection from the sinus of diverticula which approach or even invade the orbital wall.

2. The sphenoidal sinus placed so far forward in the body of the sphenoid that the external wall of the sinus becomes in part the inner lateral wall of the orbit.

Diverticula of various dimensions were found in 23 per cent of the specimens which approached, or actually invaded, the orbital wall. These ranged from comparatively small dimpling to a very sizable, cavernous-like prolongation extending well toward the orbital wall, so that a relatively thin plate of bone separated the orbit from the sinus. Seventeen measured .5 mm.

or less in the thickness of the intervening wall. Certain of these diverticula are so placed that any products will naturally gravitate and remain undrained in close proximity to the orbit and its contents.

Over sixty per cent of the specimens examined had sinuses occupying the entire body of the sphenoid or placed anteriorly, having a wall in common with the orbit.

Of these two groups presenting either diverticula or a wall common to both sinus and orbit, 55 per cent had walls .5 mm. or less in thickness. Computed on the basis of the total 100 skulls examined 33 1/2 per cent have intervening walls of .5 mm. or less in thickness.

Such an anatomical arrangement in one-third of individuals suggests immediately the possibility of a morbid process in a sinus of this type becoming an exciting factor in disease of the orbit.

It is suggested that there may be the same relation of lymphatics and veins existing between the lining membranes of the orbit and the sinuses, as exists between the scalp and the meninges, where a thick plate of bone is interposed and where a definite avenue of infection exists.

No account was taken of dehiscences owing to the dry nature of the material. W. R. P.

Metastatic Abscess of the Episclera, With Report of a Case.

Lamb, R. S. (*Ophthalmoscope,* March, 1911). After briefly abstracting the case-reports which were somewhat similar in nature, the author reports a case of metastatic abscess of the episclera.

The patient, a man of 53 years, developed what seemed to be pink eye in the right eye, two days after a carbuncle had appeared on the left side of his neck. An edema of the ocular conjunctiva presented itself in the lower cul-de-sac and became general. An underlying swelling could be seen two days later in the lower, outer portions of the episclera, having no inflammatory signs, as of the congestion commonly seen in scleritis or episcleritis, except that there was excruciating pain requiring morphine. Vision normal. No iritis. The episcleral swelling increased, as also the chemosis, assuming the shape of a large pea, of yellowish color. Pus was evacuated and the wound reopened daily for drainage as it showed a persistent tendency to close. The rim was excised and the actual cautery used, and finally an incision, transversing the abscess completely was made, and it was wiped out with pure tincture of iodine. Entire recovery followed, with vision of 6/4 with correction of 2.5 D.

The most satisfactory feature of the case was the outcome, no astigmia, normal vision with correcting lens, and no alteration in the appearance of the eye. W. R. P.

Two Cases of Hereditary Congenital Word-Blindness.

HINSHELWOOD, JAMES (*Brit. Med. Jour.*, March 18, 1911), refers to a previously published report of four cases in one family. The two cases in the present report are niece and nephew of the former cases. These cases emphasize the fact that the condition may assume a family type. The mother has never had any trouble in reading and her other four children are normal in this particular.

The first case is a girl of 12. She has been at school for seven years and reads very imperfectly, being able only to recognize the commoner words of one syllable. She does very well at arithmetic. however, and is bright and quick in other ways. The second case is a boy of 10. His case is much worse in type. He has been to school for four years and cannot even recognize all the letters of the alphabet. He does very poorly at arithmetic, being unable to recognize the figures. E. S. T.

The Etiology of Iritis.

BUTLER, HARRISON T. (*Brit. Med. Jour.*, April 8, 1911), speaks of the wide divergence of opinion in some recently published papers on the causation of idiopathic iritis. He has made a record of his own cases, both in his dispensary and his private practice. There were 100 cases of iritis in 5710 patients. He discusses certain features of the acute condition and gives his method of procedure, excluding syphilis, gonorrhea, the toxemias, and finally tuberculosis. The causal conditions are enumerated as follows: Syphilis, 22; oral or nasal sepsis, 12; gonorrhea, 6; rheumatism, 6; tuberculo-toxemia, 5; intestinal stasis, 4; albuminuria, 2; diabetes, 1; tuberculosis, 1; and doubtful, 41.

"Only 5 to 6 per cent can truly be termed rheumatic," and "In at least 30 per cent of all cases it is almost impossible to determine the real origin of the disease," are two very interesting observations. E. S. T.

A Few Points on Some Common Affections of the Eyes.

BENNETT, H. PERCY (*Brit. Med. Jour.*, April 8. 1911). This paper is a very practical resume of well known points in the diagnosis and treatment of diseases of the conjunctiva, cornea, iris, and lacrimal sac. E. S. T.

The Mechanical Etiology of Optic Neuritis.

MAMOURIAN, MARCUS, and SMITH, CHARLES JOHNSTON (*Brit. Med. Jour.*, April 8, 1911). The views as to the causation of papilledema, as summarized by F. W. Mott, are:

1. That it is due to inflammation or irritation of the optic nerve sheath, produced either by irritation arising from substances in the cerebro-spinal fluid of the sheath of the optic nerve or by direct extension of meningitis.

2. That it is due to obstruction to the outflow of venous blood from the ophthalmic vein by increased intracranial pressure on the cavernous sinus. But this theory of von Graefe has been disproved by the fact that a free anastomosis occurs between the ophthalmic and facial veins.

3. That the intracranial pressure interferes with the return of lymph from the sheath of the optic nerve.

Gowers favors the first view by attributing optic neuritis to the possible presence of toxic substances in the cerebro-spinal fluid, while Osler and Elschnig regard the presence of inflammation as essential to its production. The above theories are largely conjectural and are not borne out by clinical evidence. Recent clinical and experimental work, especially the researches of Sir Victor Horsley, have greatly helped to convert the authors to the belief that increased intracranial pressure is the principal mechanical agent in the production of papilledema, although they agree that the chief factor which produces this pressure has not as yet been definitely ascertained.

"It has been conclusively established that the cerebro-spinal fluid is secreted by the chorioid plexuses of the ventricles, and that the channels of its resorption are the superior cerebral veins which join the superior longitudinal sinus. The ventricles then may be looked upon as reservoirs for the constantly secreted cerebro-spinal fluid, while the subarachnoid space constitutes the main absorptive area. . . . Our observations lead us to advance the contention that arrest of, or marked interference with, the cerebral venous return, (with consequent subnormal cerebro-spinal fluid absorption) is the predominant factor in producing increased intracranial pressure, and that papilledema is due to the resulting rise of fluid pressure in the optic nerve sheath. Given a condition of inhibition of the process of absorption, the pressure in the subarachnoid space will increase, either by continued secretion of cerebro-spinal fluid or by the diminution of the cerebro-cranial space."

They consider, then, that papilledema results from the lessened or arrested absorption of fluid from the subarachnoid space in consequence of—

(a) Obliteration of the patency of the superior cerebral veins.

(b) Disorganization of the perivascular lymphatic sheaths.

(c) Occlusion of one or more of the venous sinuses.

Optic neuritis is found in connection with (a) vascular, (b) organismal, and (c) neoplasmic lesions. The explanation of its occurrence from lateral sinus thrombosis is that the main channel for the discharge of surplus cerebro-spinal fluid is occluded. In syphilis the endolymphangitis, which has been carefully studied, is doubtless responsible for the impairment of the absorptive function of the superior cerebral veins. In meningitis the lymphatic sheaths are probably not always involved. Papilledema, however, is bound to result whenever the inflammatory process seals the openings of these "intra-cerebral prolongations of the subarachnoid space." Tumors act by compressing the brain substance adjacent to them and ultimately the veins. E. S. T.

The Prescription of Glasses.

Morrell, Reginald A. (*Brit. Med. Jour.*, May 13, 1911), deals mainly with the question of relief of eye-strain and lays stress upon a proper diagnosis of the cause of the asthenopia. Questions of the general health should be carefully considered. Two important questions must be answered (1) Is the prescription to be considered as permanent? (2) Under what conditions are the glasses to be worn? E. S. T.

The Etiology of Iritis.

Yeld, Reginald A. (*Brit. Med. Jour.*, May 13, 1911). This article gives an analysis of 159 cases of primary iritis occurring in St. Bartholomew's hospital. Syphilitic, 45.28 per cent; rheumatic, 16.35 per cent; gonorrheal, 15.09 per cent; toxemic, 10.06 per cent; gouty, 1.25 per cent; osteoarthritic, 1.25 per cent; obscure, 10.6 per cent. E. S. T.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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Albert C. Sautter, M. D.,

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Frederick Krauss, M. D.,

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ST. LOUIS.

On Circumscribed Nutritial Regions in the Occipital Lobe and Their Significance Regarding Our Knowledge of the Visual Center.

Henschen, Stockholm (*Archiv. fuer Ophthal.*, Vol. 78, part 1). The article is largely controversial, attacking the stand taken by v. Monakow and his follows.

Henschen holds to the view that the visual center is confined solely to the calcarine cortex and cites cases and submits photographs of sections in support of this view.

These show that lesions without the cortex do not produce scotomata, that a lesion of the entire calcarine cortex alone will cause a complete hemianopsia and that small cortical lesions produce analogous symptoms (scotomata).

He considers the cortex (including a strip of subcortex ¼-½ mm. in thickness) and the deeper medulla nutritially independent of each other, an assertion in accord with the results of anatomic investigations. (Duret, Charcot.) While he admits that both regions may be involved simultaneously, it is possible thus for the cortex and deeper medulla to become diseased independently.

Monakow-Wehrli's assertion that in every case of extensive cortical malacia ½ cm. of medulla is simultaneously involved is based on false premises and is entirely without proof.

A. C. S.

The Division of Function in the Eye and the Theory of Night-blindness.

Kries, J., Freiburg (*Klin. Monatsbl. fuer Augenheilkunde*, March, 1911). The theory of dual functions in the eye, that is, two forms of visions, namely, vision in bright light and vision in poor light, or twilight vision, has received considerable attention in the past year. This theory is of great interest, especially in those cases of congenital color blindness which are viewed as a failure of the substratum of vision in bright light and in cases of nightblindness, or hemeralopia, which can be viewed as being due to a failure of the organ devoted to twilight vision.

The functions of the rods and cones of the eye may be divided, according to the illumination, into five grades. The first grade would be strong light in which through a considerable destruction of the visual purple or perhaps through restrictive action, any perceptible function of the rods is abolished.

The second division includes still a high degree of light, in which the vision is largely accomplished by means of the cones, the sensitiveness of the excentric parts of the field being less than the fovea.

In the third division is included that degree of illumination in which the visual acuity of the rods and cones is apparently the same, though the adaptation of the periphery is really greater than that of the fovea. This area includes the illumination of 50 to 1 M. K.

In the fourth division he includes that degree of illumination in which the function of the rods is much greater and is practically the main reliance of vision, though the cones still have some visual power.

That the adaptation of the cones to the quantitative and qualitative perception of light is less than that of the rods is especially seen in the rod free macula, which takes three to four minutes before it can adapt itself to greatly lessened light.

The adaptation of the rods to lowered light is much more rapid and this is the function largely exercised by them.

The phrase "adaptation function" is proposed by Kries to include not only the rapidity of adaptation to lessened light, but also the rapidity with which this sensitiveness develops after the sudden exclusion of light, theoretically, testing the vitality of the visual purple.

. This illumination includes the area of 1 to 1/30 M. K.

In the fifth division, an illumination of less than 1/30 M. K., the function of cones is abolished.

The paper treats of the practical application of these divisions in the illumination of streets at night and its relationship to hemeralopia and should be read in the original to be appreciated. F. K.

A Brief Contribution Concerning an Ocular Symptom in the Left-Handed.

Enslin, Berlin (*Muench. med. Woch.*, October 25, 1910, No. 43), after use of the experiment suggested by Rosenbach, finds that in one-third of the cases of left-handed persons having normal vision in both eyes the left eye is the predominating eye in binocular vision.

Rosenbach had found that when a small distant object seen with binocular vision is covered by holding the finger before it some distance away from the eye, it is invariably found, upon closing each eye separately, that the right field is the one covered by the finger, thus showing that the most exact vision is obtained by the right eye in right-handed persons if both eyes have equal vision. Similarly, if the eyes are unequal, the field of the best eye is found covered by the finger. F. K.

Inheritance of Acquired Ocular Defects.

Tobias, Berlin (*Klin. Monatsbl. fuer Augenheilk.*, February, 1911), as bearing upon this question, records an instance where a mother with bilateral operative colobomata of the iris gave birth to two children with congenital colobomata of the iris and chorioid. The three older children had normal eyes. The operation had been performed four years before her marriage. In the right eye the coloboma was below and in the left eye up and in. The one, male, child which died in its first year, had bilateral colobomata below. The living, female, child had a coloboma of the iris, lens and chorioid down and in.

W. Z.

The Growth of the Eyeball Following Cataract Operations in the Young.

Wessely, K., Wurzburg (*Muench. med. Woch.*, July 5, 1910), found in an examination of 44 cases operated upon for juvenile cataract that after a lapse of years the eyes in patients operated upon at ages from 2 to 9 years had a lessened breadth of cornea of .8 mm. In patients operated upon at ages of 10 to 25 years the shrinkage from normal was but .32 mm. In nonoperated cases of cataract, the cornea attained its normal growth.

F. K.

Concerning the Regulation of Ocular Position by the Auditory Apparatus.

Bartels, M., Strassburg (*Archiv. fuer Ophthal.*, Vol. 78, part 1), concludes as the result of experimental investigations that—

In the normal animal the ocular movements induced by the auditory apparatus are always effected by a pair of muscles, one of which contracts while the antagonist simultaneously relaxes.

Contraction is somewhat stronger than relaxation.

During labyrinth irritation the muscles, excepting the nystagmus twitchings, are continuously elongated or shortened.

During the transition from rotation to after-nystagmus, simultaneous relaxation of both muscles occurs for a brief period.

A single muscle may effect nystagmus towards either side.

The abrupt change from the slow to the rapid phase always occurs during maximal tension alteration, viz., during maximal relaxation or maximal contraction.

The muscle actions during the slow phase are quite different from those occurring in the rapid phase; only the former originate from the ear.

In narcosis, the rapid phase is first suppressed in the muscle whose slow phase represents relaxation.

In deep narcosis contraction is distinctly more vigorous than relaxation.

The slow ocular movements induced by the ear disappear only in deepest narcosis, being thus one of the last reflexes of the living organism.

Thermic nystagmus, in respect to the activity of a single muscle, resembles principally rotation nystagmus. Regarding the muscle actions only quantitative differences exist.

Acceleration of the slow phase in thermic nystagmus may simulate pendulum nystagmus.

In the slow phase contraction is slower during commencement, relaxation slower at the end.

The co-operation of simultaneous contraction and relaxation of the eye muscles thus occurs in a most economical manner.

Only the existence of a lasting, reflex, vital, not mechanically induced state of tension (ear tonus) explains the relaxation of the eye muscles in auditory irritation.

The observed relaxation represents a muscle function.

The so-called ear tonus facilitates precise and rapid ocular movements.

All eye muscles are permanently under the influence of this ear tonus, even in deepest narcosis.

The alteration of the muscle states observed in the curve charts are dependent upon an increase or decrease of ear tonus.

In rotation, as in thermic irritation, an innervation during the slow phase is sent from each labyrinth to each eye muscle; to the internus as well as to the externus of the same side.

The sensory peripheral stimuli for the rapid phase proceed from both muscles, from the contracted as well as from the relaxed.

A. C. S.

Accommodation in the Eye of the Turtle.

Wychgram, Kiel (*Klin. Monatsbl. fuer Augenheilk.*, November and December, 1910), as the result of his investigations, concludes that: The accommodation of the water turtle can readily be explained by the Helmholtz theory. The physiologic facts which support it are that the form of the accommodated lens is that of its elastic position of equilibrium, as is proven by the form of the isolated lens. It is brought about through the tension of the suspensory ligament which results from the action of the ciliary muscle. The slight depression of the peripheral surface of the lens characteristic of lenticonus and produced by miosis does not cause an increase in the refraction. Its object is the shutting out of the peripheral rays of higher index. W. Z.

Sudden Mydriasis in a Healthy Seven-Year-Old Child.

Cramer, Cottbus (*Klin. Monatsbl. fuer Augenheilk.*, February, 1911). When the child fixed the face of the observer with both eyes, there was at first a very decided unilateral mydriasis, but in a short time this gave place to a contraction of the pupil and an almost full dilatation of the pupil of the other eye. There was no periodicity in the phenomenon. The reaction of the pupils to direct and consensual light stimulus was normal. During convergence under the effect of the immediate change in fixation both pupils reacted almost equally and together, but during continued reading the original condition recurred. All other functioning of the musculature was normal. Aside from greatly enlarged lymphatics the child was apparently healthy. W. Z.

The Etiology and Pathogenesis of Secondary Divergent Strabismus.

Rönne, Copenhagen (*Archiv. fuer Ophthal.*, Vol. 78. part 1). The article is based upon the material of the Copenhagen Clinic from 1870-1909, including 3,865 operations for concomitant convergent strabismus; 673 for concomitant divergent strabismus, 11 and 211 cases of secondary convergent and divergent strabismus, respectively. He discusses the subject in full under the following headings: The influence of sex, the significance of the nature of the primary operation (within each decade secondary divergent strabismus occurred twice as frequent after double tenotomy than after single tenotomy), alternating and monolateral strabismus, the influence of refraction, the age at the time of the primary operation, the duration of the affection before the primary operation, the amount of deviation before the primary operation, the immediate effect after primary operation, the pathogenesis of secondary strabismus and the indications for the primary operation.

He believes that in general tenotomy is no more liable to be followed by secondary divergence than advancement.

A. C. S.

Pathologico-anatomy of Blepharoconjunctivitis.

Ishihara, Tokio (*Klin. Monatsbl. fuer Augenheilk.*, February, 1911), has studied microscopically three cases of diplobacillary conjunctivitis. He summarizes his findings as follows: That the conjunctival changes do not differ from those of chronic catarrhal conjunctivitis. They consist principally of epithelial changes with numerous goblet cells and an infiltration of the mucosa with leucocytes particularly rich in plasma cells. The bacilli were not found either in the epithelium or in the mucosa; characteristic changes in the skin of the lids corresponding in important particulars with those of eczema, consisting of an edematous saturation and acanthotic growth of the papillary and of a paraceratotic affection of the granular layer and the horny layer. The bacilli are found in the diseased epithelial layers, with preference for the horny layer, where they penetrate into the hair follicles. They are only rarely found in the papillary layer. He concludes that the Morax-Axenfeld diplobacillus remains superficial in the conjunctiva and does not penetrate into the tissues, whereas upon the lid skin the epithelial layers appear to be the one suitable culture medium. W. Z.

Clinical and Experimental Investigations of The Morax-Axenfeld Diplobacillary Conjunctivitis.

Reis, Lemberg (*Klin. Monatsbl. fuer Augenheilk.*, November and December, 1910), from comparative experiments in vitro of the effects of zinc sulphate, silver nitrate and bichlorid, concludes, in part, that the last two substances have a more intensive inhibitive action upon the development of the diplobacillus than has zinc sulphate. That nitrate of silver destroys the activity of the diplobacillus in weaker solutions and in shorter time. That the serum of healthy individuals and that of individuals with diplobacillary conjunctivitis possess no bacterolytic properties towards the diplobacillus, and that this is true also of the conjunctival secretion. That the serum of a rabbit immunized to the diplobacillus possesses bacterolytic and agglutinating properties in the highest degree. In the serum of a normal animal organism, a normal agglutinin for the diplobacillus can be demonstrated, which, however, contrary to the immunized agglutinin, possesses but a weak agglutination. The diplobacillus is but very slightly phagocytic.

The serum takes no part in the local ocular condition. The action of the curative agents in diplobacillary conjunctivitis is dependent upon the contraction of the blood vessels and constriction of the tissues, properties possessed by all of these agents. W. Z.

Pneumococcus Conjunctivitis in Pneumonia With a Histologic Examination

Rosenhauch, Krakau (*Klin. Monatsbl. fuer Augenheilk.*, February, 1911). The patient was a one-year-old child, who developed pneumonia following measles. The discharge from the conjunctiva, which was profuse, thick and grayish yellow, had been present three days. On the following day the child died. A smear made during life showed the presence of pneumococci. Histologic examination of the excised entire conjunctival sac (after death) showed that the epithelium of the conjunctiva was but little affected. Some of the cells were degenerated, and the intercellular spaces contained migratory cells. The dilated blood vessels were filled with red blood corpuscles. There were a few goblet cells, and a slight round cell infiltration of the mucosa. There were no foci of round cells. Towards the retrotarsal fold the changes were of the same nature but more pronounced. The round cell infiltration was marked in the subepithelial bulbar conjunctiva in the direction of both retrotarsal folds. In places the conjunctiva was overlaid with secretion composed of fibrin, mucus and leucocytes. Pneumococci were found in this secretion and also, in fewer numbers, in the epithelium and submucous tissue. He agrees with Green and Pfitzner in considering goblet cells as normal elements which, under pathologic conditions, increase and then have an important share in the increased secretion of mucus.

W. Z.

On Eel Blood Conjunctivitis.

Pöllot and Rahlson (*Archiv. fuer Ophthal.*, Vol. 78, part 1) report a case of conjunctivitis following the accidental introduction into the conjunctiva of a few drops of eel blood.

The affection was characterized by an acute inflammation of the conjunctiva with chemosis and some lid swelling, resembling somewhat the condition resulting from the action of mild caustics. Eel blood corpuscles were found in the secretion. The symptoms subsided within 24 hours.

The authors review the literature, in particular the Mosso brothers' contributions.

To test the local irritant action of eel blood, Pöllot instilled the serum in rabbits', cats' and dogs' eyes and in his own eye. Conjunctivitis followed every instillation excepting in the case of the dog.

The results of Pöllot's investigations with active and inactive sera show that the local irritant action is due to a toxin (ichthyotoxicum) contained in the albuminous constituents of the blood, not in the globulins, but in the serum albumins or allied substances. A. C. S.

Ophthalmomyasis.

GUTZMAN, Wien (*Klin. Monatsbl. fuer Augenheilk.*, November and December, 1910). The patient was a woman 77 years of age. There was a severe catarrhal conjunctivitis with swelling and redness of the lids. The worms were present in both eyes. The cornea of one eye presented a small marginal ulcer. One external auditory canal was also infested. The worms proved to be the larvæ of the lucilia sericata Meigen, never before observed under similar conditions. W. Z.

The Uses of Sophol in Ophthalmia Neonatorum.

HERFF, OTTO, Basel (*Muench. med. Woch.*, September 13, 1910), finds that sophol is without doubt the best prophylactic in ophthalmia neonatorum as well as being therapeutically active in the cure of the disease. He believes that it is the silver salt best adapted for prophylactic use by the midwife.

F. K.

The Use of Resorcin in the Treatment of Chronic Conjunctivitis.

KNAPP, PAUL, Basel (*Klin. Monatsbl. fuer Augenheilkunde*, January, 1911), uses the resorcin in two to three per cent solutions two or three times daily in certain forms of chronic conjunctivitis, in which it frequently has a better effect than zinc solutions. It is also pleasanter to use than the latter, as the resorcin solution smarts but three or four seconds and is followed by a grateful sense of relief.

The solutions turn dark after a time, especially if combined with boric acid, zinc, etc. Its efficiency is not altered by this fact. F. K.

The Lighter Forms of Keratomycosis Aspergillina.

Marx, E., Leiden, Holland (*Klin. Monatsbl. fuer Augenheilkunde*, March, 1911), reports two cases of aspergillus infection in one of which it was not suspected until the culture had been made, while in the second it was possible to diagnose it with the aid of the lupe. The corneal ulcers healed under the use of moist heat, scopolamine, zinc and bandage.

F. K.

Traumatic Emphysema of the Cornea.

Gallenga, Parma (*Klin. Monatsbl. fuer Augenheilk.*, February, 1911), calls attention to a lesion of the cornea due to the entrance of atmospheric air between the lamellæ of the cornea. It is characterized by a striking reflecting punctated more or less circumscribed opacity in the vicinity of the wound. He has observed it mostly in small accidental wounds in artisans, and in children in wounds received in play. In one instance it complicated an operation wound. For this lesion to result, the offending article must be small and pointed, and must enter the cornea almost tangential, and finally, in its extraction, a leverage must have been exerted so that the lamellæ are separated and the air gains entrance. The opacity results from the difference in the index of refraction between the air and the corneal tissue. With the corneal microscope the inclosed air bubbles can be differentiated. The condition usually lasts only a few hours. He was able to produce it experimentally. W. Z.

Observations Upon Parenchymatous Keratitis Following Trauma.

Mohr, Breslau (*Klin. Monatsbl. fuer Augenheilk.*, November and December, 1910), reports two cases of traumatic parenchymatous keratitis. The first was seen in a man 25 years of age. Eight days following the injection into the eye of a stream of soda-water from a siphon bottle, the eye showed a beginning parenchymatous keratitis. A Wassermann reaction was positive. The inflammation ran a typical course. The other eye did not become involved. In the second case the inflammation followed the entrance into the eye of a piece of coal. The Wassermann reaction was normal. The other eye did not become inflamed. The author believes that there are sufficient authentic cases from which to conclude that parenchymatous keratitis can be excited by trauma. It is most to be suspected as a cause in individuals whose age precludes the influence of heredity. Whether only individuals who are either syphilitic or tuberculous develop a parenchymatous keratitis from trauma remains to be proven. W. Z.

Concerning Corneal Delles (Dellen).

Fuchs, Vienna (*Archiv. fuer Ophthal.*, Vol 78, Part 1), describes a delle as a shallow, saucer-shaped depression, with rounded off edges situated at the margin of the cornea, usually the temporal margin, the limbus being slightly involved. The central border is generally perpendicular, the peripheral sloping out gradually.

In most cases the delle forms an ellipse, the long axis being parallel to the limbus. The horizontal diameter averages 1-2 mm., the vertical 2.5-3.5 mm., the depth .5 mm. The base exhibits a silver-like opaqueness, the deepest portion appearing dry and xerotic; only in rare instances is the delle transparent.

Sensibility is decreased in the depression. There is usually slight pericorneal and localized conjunctival injection. Duration several hours to 24 hours, though in a few cases delles have been observed longer than 48 hours.

Fuchs observed this complication in the following conditions:

1. Swelling of the adjoining conjunctiva and episcleral tissue (episcleritis, angioma, ecchymosis, pinguecula, after advancement operations and subconjunctival injections).
2. After cocain instillations.
3. After cataract operations.
4. Hemeralopia.
5. Paralytic lagophthalmos.
6. Spontaneously in elderly subjects.

This affection must be differentiated from Gaule's pits, which are smaller, more superficial and principally confined to the center of the cornea. Delles may form under a bandage, whereas Gaule's pits are etiologically related to prolonged exposure of the cornea to the air, disappearing when the cornea is moistened again.

In one case microscopical examination disclosed a flattening of the epithelial layer, due to decrease in size of each epithelial cell and approximation of the fibers of the subepithelial tissue, both conditions undoubtedly the immediate result of fluid abstraction. While evaporation probably plays a rôle in the etiology of this affection, the important underlying cause is probably to be found in a disturbance of innervation.

The development of delles may be associated with a lesion of one or more of the superficial nerve trunks supplying the periphery of the cornea. Such lesions might follow muscle operations, the stretching or compression induced by conjunctival swellings, or the instillation of cocain.

The sharply circumscribed appearance of the depression is suggestive of such a lesion. A. C. S.

The Treatment of Keratitis Dendritica.

Knapp, Paul, Basel (*Klin. Monatsbl. fuer Augenheilkunde*, January, 1911), believes that while thermocautery is the best remedy for this stubborn affection, it is frequently followed by serious scarring and loss of vision. He has recently had excellent results in five cases of keratitis dendritica, in which he has applied aqua chlorata after scraping away the affected area on the cornea. In four of these cases the disease was cured in to two to six days without scar tissue and with full visual acuity. F. K.

Has the Capsular Epithelium of the Lens a So-Called Protective Function to the Lens and Has It Significance for the Origin of Cataract?

Kuwabara, Kokura (*Klin. Monatsbl. fuer Augenheilk.*, November and December, 1910), analyzes the above questions from the standpoint of anatomy, pathologico-anatomy and physiology and concludes that the lens fibers and the capsular epithelium are affected coincidently by injurious external influences (the former more seriously than the latter), as both are derived from the ectoderm and the first less protected than the second. That the nutrition of the lens occurs through the biologic activity of the capsular epithelium as well as through the protective influence it has over the lens (similar to that of the endothelium of the cornea) is to be rejected. That the principal property of the capsule is the protection of the lens from the penetration of the aqueous and that the capsular epithelium has principally to do with the preservation and growth of the capsule. That the biologic activity to maintain the physiologic properties of the lens during life is the biologic property of the young cortical fibers. That Hess and Leber's hypothesis to explain the origin of the different forms of cataract leads to great difficulties, but that the origin of these various forms is readily explicable by the above conception. That the primary cause of cataract is to be sought, not in damage to the capsular epithelium, but to direct injury to the lens fibers through injurious agencies. W. Z.

Grouped Pigmentation in the Eyeground.

Hoeg-Niels, Copenhagen (*Klin. Monatsbl. fuer Augenheilkunde,* January, 1911), describes a form of retinal pigmentation which appears spread over a large or small area, usually a section of the eyeground, and consists of sharply defined, black or grayish black pigment spots, which show a decided tendency to form into distinct groups. They show no relationship with other changes in other parts of the eyeground and exert no influence on the sight. The author has gathered six cases, in addition to the four reported by himself. He believes this condition to be an anomaly occurring early in the development of the eye, probably due to an irregular formation of pigment epithelium. F. K.

A Contribution to the Anatomy of Congenital Ectropion Uvea.

Okuse, Tokio (*Klin. Monatsbl. fuer Augenheilk.,* February, 1911), examined a section of iris removed from the eye of a youth presenting ectropia uvea. The iris tissue was markedly pigmented, especially in its anterior layers. The sphincter, both in its width and thickness, was of enormous dimensions. It was bent sharply outwards towards the pupillary margin, so that the inner end of the muscle-layer reached far forward. The posterior pigment layer was greatly thickened. At the iris root it was somewhat thicker than normal. The nearer it approached the pupillary margin the more numerous became the irregular outgrowths. At the pupillary margin there was a projecting outgrowth which inclosed an irregular triangular cavity corresponding to the sinus annularis of Szily. Of the three walls, the inner one was thick and plump, while the lateral walls, reaching nearly to the pupil, were thin. The posterior wall was irregular. The surfaces towards the cavity were all smooth. Further forward than the triangle there was another pigment knob. The cells were cylindrical in type. He considers the condition to be an anomaly of development consisting in a modified growth of the epidermal layer of the iris. W. Z.

The Pathogenesis of Sympathetic Ophthalmia.

DEUTSCHMANN, F., Hamburg (*Archiv. fuer Ophthal.*, Vol. 78, Part 3), reports a case of typical sympathetic ophthalmia in which the primary eye was enucleated and portions of the chorioid inoculated into the eyes of monkeys and rabbits, from which further inoculations were made into other animals' eyes. Careful microscopic studies were made in each case.

Examination of the eyes of the animals (two monkeys, two rabbits) directly inoculated showed a chronic inflammation with fresh round cell infiltration in the primary eye, occurring in one case as late as eight and one-half months after infection; in three of the animals a general uveitis was observed and in one case phthisis bulbi.

In passing from the eye to the optic nerve the inflammation followed one of two routes, either directly from the chorioid to the intervaginal lymph spaces or with the anterior ciliary vessels around the globe within the muscle cone to the nerve lymph sheaths behind the eye.

In every one of the four animals there were signs of inflammation or of previous inflammation in the sheaths of the optic nerve; in three there was marked meningitis, in one the exudate completely covering the chiasm. In the opposite eyes the nerve sheaths showed similar changes; an extensive uveitis was observed in two and an iridocyclitis in one animal.

The course taken by the inflammation from the lymph sheaths of the opposite nerve to the corresponding eye occurred either directly from the lymph sheaths to the chorioid or with the central vessels to the disk and vitreous, or the inflammation left the lymph sheaths, passing between muscles and eyeball to the anterior ciliary vessels and ciliary body, in this case a cyclitis preceding the papillitis.

In all four animals, therefore, the transference of disease to the fellow eye was by way of the nerve sheaths, contributing thus valuable evidence in favor of the optic nerve theory.

He believes that meningitis in man may exist without clinical manifestations, as often occurs in meningitis due to chronic alcoholism, chronic nephritis and sclerotic processes. The early isolated occurrence of enlarged blind spot in the second eye can only be explained by a descending perineuritis in that eye.

The various anatomic changes and clinical signs in man are in close accord with these experimental findings; further studies, however, are necessary before positive conclusions regarding the pathogenesis can be deduced. Schirmer, Ruge and Gradle, who also made experimental inoculations, found a chronic inflammation in the first eye, without ophthalmoscopic changes in the second eye. Deutschmann's investigations show that even though grossly visible changes are absent, profound histologic alterations may be present.

Not only monkeys but albinotic rabbits are suitable for such experiments. Both eyes and both optic nerves, the chiasm, brain and meninges should be studied microscopically and regional enlarged lymph glands looked for. A. C. S.

Investigations Regarding Sympathetic Ophthalmia. Part 3.

Elschnig, Prague (*Archiv. fuer Ophthal.*, Vol. 78, Part 3). In the author's third chapter on sympathetic ophthalmia a new theory regarding the etiology is submitted, the same being based on previously published investigations and on a recent study of 142 cases of iridocyclitis.

He believes that the affection is not the result of infectious agents, but dependent upon constitutional anomalies, nephritis, diabetes, etc., or auto-intoxications in the broadest sense of the term, the disease in the second eye and the similarity between the anatomical picture in the uveal portions of the primary eye unaffected with endophthalmitis and that observed in the sympathizing eye being the result of an acquired hypersusceptibility of the uvea.

The process takes place thus—by the traumatism the primary eye becomes seriously damaged and possibly infected with one of the usual infectious agents, or the eye succumbs at once to a nonbacterial inflammation because of an existing constitutional anomaly (traumatic aseptic chronic uveitis). The tissue necrosis accompanying the inflammation leads to antigenous absorption of uveal tissue and consequently to hypersusceptibility of the remaining portions of the uvea of the first eye not affected by the traumatism and primary inflammation, as well as to hypersusceptibility of the normal uvea of the fellow eye. By reason of this induced localized hypersusceptibility of the uvea, any coexisting somatic anomaly may assert itself, giving rise to that variety of uveal inflammation in each eye known as sympathetic inflammation.

The affection being the result of the interchangeable influence of macro and introduced microorganisms, the anatomic picture is dependent on the variety and virulency of the inflammatory excitant and on the kind of reaction in the organ and organism.

The interval period between the primary traumatism and the appearance of sympathetic disease in the fellow eye, the occurrence of sympathetic inflammation after nonpenetrating injuries and intraocular sarcomata, the absence of the same after panophthalmitis, etc., are easily explained by this theory.

In the five published cases of sympathetic ophthalmia which came to autopsy there was found nephritis with cerebral tumor, nephritis with tuberculosis, nephritis with endocarditis, cancer of the stomach and purulent meningitis.

Acceptance of the author's theory leads to the recognition of spontaneous (idiopathic) iridocyclitis as a possible cause of sympathetic ophthalmia.

While these investigations add nothing to our knowledge concerning the diagnosis of sympathetic ophthalmia (preferably designated anaphylactic iridocyclitis [uveitis]), they broaden our views regarding prophylaxis. To careful general examinations, dietetic and hygienic regulations he attributes the fact that in the past four years not a single case of sympathetic ophthalmia was observed in his clinic. A. C. S.

Experimental Investigations Into the Transference of the Irritant in Sympathetic Troubles.

Miyashita, Tokio (*Klin. Monatsbl. fuer Augenheilk.*, February, 1911), undertook animal experimentation along the line of Römer's work to determine the presence in the anterior chamber of hemolytic amboceptors. He obtained 10 positive and 18 negative results and 8 indeterminable. Among the negative results there were 2 demonstrating the weakness of the method. More hemolysin was demonstrable on the control side than on the side to which the irritant should have been conveyed. If from the 10 positive results are eliminated 7 in which the difference was so slight that it might be considered the result of technical imperfections, it leaves 3 with clearly positive results. While these results are suggestive, they do not prove the transference of the irritant, but they in a measure complement the results secured by Römer. W. Z.

Supplement to F. Deutschmann's Article on the Pathogenesis of Sympathetic Ophthalmia.

DEUTSCHMANN, R. (*Archiv. fuer Ophthal.*, Vol. 78, Part 3), attacks Römer's views upholding the metastatic theory, basing his remarks largely on the experimental results obtained by F. Deutschmann. A. C. S.

Two Cases of Sympathetic Ophthalmia Treated With Salvarsan.

FLEISCHER, B., Tübingen (*Klin. Monatsbl. fuer Augenheilkunde*, March, 1911), injected small doses of salvarsan (0.25 and 0.2 gr. respectively) into two cases of sympathetic ophthalmia due to perforating injuries of the eye in nonsyphilitic subjects. The results were negative, though the author believes that further attempts are justifiable.

Fleming and Siegrist have reported favorable action in isolated cases. F. K.

A Remarkable Case of Tuberculosis of the Eye With Postmortem Findings. A Contribution to Tuberculin Treatment.

HAYASHI, M., Tokio (*Klin. Monatsbl. fuer Augenheilkunde*, March, 1911). The pathology of the nodular growths of the iris resembling tuberculosis of the iris has not been clearly ascertained. The finding of the tubercle bacillus is rarely possible except by implantation of excised portions into the anterior chamber of rabbits.

The case reported by the author occurred in a 42-year-old woman, who had been under close observation for three years and finally died of croupous pneumonia.

The pathologic examination was made with great care and caused much surprise. Not only were no tubercle bacilli found, which in itself is not a rare thing, but the eye presented a typical picture of plastic iridocyclitis and showed nothing that could be traced to a tubercular process. The rest of the body showed no traces of a tubercular nature. The author for lack of any other explanation is of the belief that the process was a tubercular one in its early stages and especially in the stage of nodular formation. After the nodules were absorbed. it presented the picture of simple chronic inflammation.

The ocular condition began with a gradual deposit on Descemet's membrane with formation of vitreous opacities. The use of antisyphilitic remedies were without effect. Several minute nodes appeared on the pupillary border of the iris. suggesting the possibility of tuberculosis, though a careful examination of the patient by skilled internists proved negative. The tubercular view was further supported by the positive reaction from the use of tuberculin injections, and the disappearance of the nodules under its use. A number of relapses with formation of nodes left no doubt as to its tubercular nature. F. K.

The Relation of Tuberculosis in the Etiology of Intraocular Hemorrhages and Retinitis Proliferans and Particularly Periphlebitis Retinalis in the Tuberculous.

AXENFELD, THEO., Freiburg (*Klin. Monatsbl. fuer Augenheilkunde*, January, 1911), is convinced that many cases of vitreous hemorrhage of unknown etiology occurring in the young are due to tuberculosis.

This would indicate frequent disease of the retinal vessels of tubercular origin, which is in apparent contradiction to the known pathologic findings.

He cites a case of total vitreous hemorrhage occurring in the right eye of a young woman in whom a careful examination of the other eye disclosed a perivasculitis surrounding a small area of chorioiditis.

There was a decided ocular reaction following the use of a small dose of tuberculin. This, the author believes, shows that both of the ocular affections were due to tubercular toxins. The perivasculitis was present in other parts of the left eye, but disappeared without leaving any evidence of disease.

In another case showing tubercular lesions of the bones, larynx, nose, conjunctiva, lacrimal sac and in the pupillary area, there were similar fugitive areas of perivasculitis, limited, however, to the veins.

In a case of beginning tuberculosis of the lungs, and chronic iridocyclitis of the left eye, there were numerous fine grayish nodules in the iritic structure of the affected eye. In the fellow eye there was no trace of uveitis, but a whitish stripe appeared, originating at the papilla near a small vein.

This whitish stripe gradually became larger, partially covering the vessels on the disk, and after two years assumed the typical appearance of retinitis proliferans. After this, chronic uveitis with inflammatory symptoms occurred, with formation of fine nodules in the iris and later vitreous hemorrhages. The value of tuberculin as a therapeutic measure is still in doubt and other additional measures should be adopted. F. K.

Vitiligo and the Eye.

KOMOTO, Tokio, (*Klin. Monatsbl. fuer Augenheilk.,* February, 1911). In Komoto's case there had been an acute inflammation of the chorioid with a general absorption of the epithelium as a sequel. The iris was unaffected. The papilla was pallid and the arteries and veins contracted. Almost coincident with the ocular condition vitiligo developed.

W. Z.

Concerning the Relation Between Vitiligo and Ocular Affections.

ERDMANN, Rostock (*Klin. Monatsbl. fuer Augenheilk.,* February, 1911), believes that the connection which Gilbert saw in his case between vitiligo and chorioiditis, optic neuritis and anterior uveitis finds support in the following case: A healthy 44-year-old man with vitiligo, without apparent cause, developed loss of vision with hemeralopia; further deterioration occurred later from a severe exudative chorioiditis in the anterior segment of the globe. This condition suggested syphilis, but the Wassermann reaction was negative. All other assignable causes were absent. He concludes that it is not unlikely that the inflammatory process in the anterior segment of the chorioid belongs to the category observed in heterochromia and that the cause of the disease which possibly was responsible earlier for the disturbance of the pigment later excited the chorioidal disease, was also responsible for the vitiligo. In all cases of inflammations of the chorioid of the above class it behooves the clinician to examine the areas of predilection, i. e., the genitals and anal folds, for the presence of vitiligo. W. Z.

A Remarkable Case of Melanosarcoma of the Papilla.

VAZQUEZ, BARRIÈRE A., Montevideo, Uruguay (*Klin. Monatsbl. fuer Augenheilkunde,* January, 1911). The patient, a thirty-two year old farmer, complained of blindness in the affected eye for fifteen days. Ophthalmoscopically the disk was replaced by a large elliptical and pigmented growth two and one-half disk diameters in size horizontally and one-third disk diameter vertically. The growth extended into the vitreous to the extent of about 3 mm.

Pathologically examined after enucleation, the tumor proved to be a melanosarcoma placed within the optic nerve, partly intra and partly extraocular, making it impossible to determine whether it had originated from within or from without the eyeball.

The author believes that it did not begin in the chorioid, which was affected at a later period, but rather that the tumor originated in the region of the lamina cribrosa, from thence following in the direction of the least resistance.

Axenfeld, who examined the specimens, believes that the tumor primarily or metastatically first appeared in the optic nerve and had no connections with the chorioid. No other evidence of metastasis or other malignant growth was discovered in the individual, who disappeared soon after the operation. F. K.

Intraocular Sarcoma in Early Childhood.

Iwumi, Tokio (*Klin. Monatsb. fuer Augenheilk.*, November and December, 1910). The right eye of a child eight months old became inflamed. The inflammation ran a course suggestive of an iridocyclitis, but just before coming under Iwumi's care, when the child was two years old, the growth perforated the globe, but was still covered by conjunctiva. The growth was a small round and spindle-celled leucosarcoma probably originating in the chorioid. W. Z.

Tenonitis in Beginning Sarcoma of the Chorioid.

Miyashita, S., Tokio (*Klin. Monatsbl. fuer Augenheilkunde*, March, 1911). The interesting and remarkable combination of intraocular growths and severe inflammations of the eye is not unknown in sarcomas of the chorioid, but is much less frequent in gliomas of the retina. The author reports two cases in which the eyes were examined pathologically after removal for sarcoma. The eyes had presented frequently recurring attacks of tenonitis, rapidly subsiding under antirheumatic treatment. Tumor formation was not suspected in one case until the eye was enucleated for absolute glaucoma. In the second case, sarcoma was suspected and the eye removed despite the fact that it possessed full visual acuity. The explanation of the cause of the tenonitis in these cases is rather difficult, especially in the early stages of sarcoma, when there is no necrosis, and consequently no toxic influence. It is probable that vasomotor or neurotic irritations may be the origin in some instances. The frequent recurrence of tenonitis over an area suspected of covering a sarcoma is of great diagnostic import. F. K.

Contribution to the Clinical Diagnosis of Double Perforations of the Globe by Iron Slivers.

Rubel, Freiburg (*Klin. Monatsbl. fuer Augenheik.*, November and December, 1910), considers that a subconjunctival hemorrhage independent of the wound or a sugillation of the lower lid in perforating wounds of the globe, excluding the cornea, the most frequent indication of a double perforation of the eyeball. He records three cases illustrative of this view. W. Z.

An Unusual Gunshot Injury to the Eye.

Laas, Frankfurt a. Oder (*Klin. Monatsbl. fuer Augenheilk.*, February, 1911), reports an interesting case of gunshot injury in which there was a double perforation of the right eye, and in the left a perforation in the cornea, into which the iris was prolapsed. In the right eye the wound was cauterized, and the neighboring conjunctiva was stitched over it. In the left eye the iris was excised and a conjunctival flap drawn over it. About two weeks later a radiograph was made and showed that in the left eye there was a shot in the posterior part of the globe, and that on the right side a shot had passed through into the orbit. Two months later the left eye still showed a Descemetitis. The vitreous in the right eye had cleared away and six months later V. = 5/5. There was a large chorioidal lesion with a vitreous string extending from it. Two years later the vision of the right eye suddenly failed, due to retinal detachment. Treatment was without avail. More than two and one-half years after the injury the vision in the left eye, which had been ½/15, still further failed, and this was accompanied by pain. Examination showed the presence of a shot on the floor of the anterior chamber from which it was with difficulty removed. Six months later V. = 2/24. W. Z.

Clinical and Experimental Observations Concerning the Relation of Salvarsan to the Cornea.

LOEHLEIN, W., Greifswald (*Muench. med. Woch.*, April 18, 1911), arrives at the following conclusions: In nine cases of luetic parenchymatous keratitis (hereditary 4, acquired 1, unclassified 4), intramuscular and subcutaneous injections of salvarsan were without positive therapeutic influence and failed in two cases to prevent the appearance of the disease in the fellow eye.

Even the local application of the drug by subconjunctival injection (.01 salvarsan on three successive days after preliminary intragluteal injection) failed in two cases to influence the corneal process.

The failure of the drug in these cases cannot be attributed to the fact that salvarsan does not penetrate the cornea, for experiments conducted by the writer showed that after intravenous or subcutaneous injections of therapeutic doses of salvarsan, arsenic could be found in the cornea (including even the nonvascular portions), 1-24 hours after administration.

A. C. S.

Experiences With Salvarsan in Ocular Syphilis From Literature and Personal Cases.

STUELP, O., Mülheim-am-Ruhr (*Klin. Monatsbl. f. Augenheilkunde*, March, 1911), states that there are about two hundred and fifty original articles written relating to the use of salvarsan in about 40,000 cases. The results have varied from the most marvelous cures to the most abject failures. Relapses and adverse actions have been reported. Plaut in his summary of cases of general syphilis arrives at the conclusion that in 77 per cent of the cases a more or less prompt beneficial effect was observed, and in 23 per cent no effect was obtained.

This result is no better than that obtained by the use of mercury and the iodides. The author has collected 470 eye cases in which salvarsan had been used and tabulates them.

He concludes that in only 65 per cent of the cases a favorable influence was exerted and that in 35 per cent no result was obtained, which would indicate a lower percentage of cures in ocular manifestations of syphilis than in general syphilis.

The author goes into the complications following its use and finds many unfavorable symptoms, both general and local. He believes, however, that in its favor may be said that when it does act favorably it acts much more quickly, one injection being equal to one week's energetic mercurial treatment. In this way the treatment of syphilis may be much shortened.

Salvarsan also acts favorably in cases of tuberculosis and nephritic syphilitic patients, in which mercury would be contraindicated. F. K.

The Salvarsan Treatment and Optic Neuritis.

Schantz, Dresden (*Muenchen. med. Woch.*, March 7, 1911), publishes two cases of secondary syphilis treated with salvarsan, followed by optic neuritis and impairment of vision.

Ophthalmoscopic examination before the injection disclosed in one case slight hyperemia of the disk and in the other slight obscuration of the disk margins.

The subsequent optic neuritis resembled the type sometimes seen in secondary syphilis. That salvarsan was not the cause of the condition was shown by the fact that repeated doses of salvarsan brought about regression of the symptoms with improvement of vision to almost normal. A. C. S.

The Effect of Ehrlich's New Syphilitic Therapy Upon Luetic Eye Diseases.

Hesse, Gratz (*Klin. Monatsbl. fuer Augenheilk.*, November and December, 1911), has treated 7 cases of luetic iridocyclitis, 3 cases of parenchymatous keratitis, 3 cases of luetic chorioiditis and one case of iridoscleritis, with salvarsan. In the first group the action was rapid, and where the papules existed they began to absorb in from 24 to 48 hours. The average time required to bring about a cure was 10 days. In parenchymatous keratitis the results were not so striking, but the clearing of the cornea had progressed to such a degree that in from four to six weeks V. = 0.2. In the third group no benefit accrued and no harm, although one patient was 74 years of age, with severe arteriosclerosis and myocarditis. The last group was also rapidly benefited. In one case of iritis a severe bilateral neuritis developed about three weeks after the injection of hyperideal. This improved for a time, then relapsed and ultimately subsided, leaving vision somewhat impaired. The Wassermann reaction was medium positive at this time. He considers the etiology of the neuritis to be in doubt. It may have been due either to the drug or to syphilis.

W. Z.

Ehrlich's "606" in Diseases of the Eye.

Schantz, F., Dresden (*Muench. med. Wochenschrift,* November 8, 1910), used this preparation in five cases of interstitial keratitis in various stages of the disease. It did not stop the progress of the disease, but he thinks that it may have hastened the disappearance of the active symptoms.

In iritis it showed marvelous action in one case. In one case of unilateral optic neuritis with hemorrhage, of syphilitic origin, a marked change for the better occurred by the next day. No effect was obtained in a case of old optic atrophy in a tabetic patient.

Schantz believes that 606 could be given in cases of beginning optic atrophy due to interstitial neuritis with benefit, but is valueless if the atrophy occurs without interstitial change in the nerve.

In old people and in tabetic atrophy with gradual increase in the blindness, the author recommends careful use of the Ehrlich preparation, since the nerve atrophy is progressive in any case, and that there might be a chance for improvement. The patient's consent to the risk should be obtained. He does not believe, however, that the total optic atrophy following the use of atoxyl will be duplicated by 606. F. K.

The Therapy of Pieces of Steel in the Lens.

Elschnig, Prag (*Klin. Monatsbl. fuer Augenheilkunde,* January, 1911), relates the further history of a case of a piece of steel in the lens of a man's eye for 19 years without causing cataract.

In the treatment of such cases he lays down the following rules:

1. In every fresh case of steel in the lens, in which the capsular wound is open, the foreign body should be extracted at once.

2. Should the capsular wound be healed when the patient is first seen the piece of steel should be removed through an operative wound in the capsule. It is often advisable to allow the foreign body to fall to the floor of the anterior chamber

and removed 24 hours later after the closure of the pupillary space by means of a miotic.

3. Should the foreign body be firmly adherent to the capsule by lymph tissue and the lens show no extension of opacity, it is advisable not to touch it. Should there be extension of the lenticular opacity, the procedure of the second rule should be adopted. F. K.

Plastic for the Restoration of the Inferior Cul de Sac in Anophthalmus.

ZEEMAN, Amsterdam (*Klin. Monatsbl. fuer Augenheilk.*, February, 1911), has successfully employed the following method for the formation of a retrotarsal fold in a case in which three other methods had failed: An incision is made in the conjunctiva 6 mm. behind and parallel to the lid border. The conjunctiva is dissected up in front and behind this incision. The artificial retrotarsal fold is made by making a vertical incision parallel to the lid margin. The depth of the cul de sac is secured by first making an incision 6 mm. beneath and parallel to the lid margin. This is carried through the skin into the cul de sac. A second incision through the skin is made 2 mm. below the first, meeting the first at each end. The narrow island still attached to the underlying tissues now becomes the fornix by suturing its upper margin to the posterior conjunctival flap and the lower margin to the anterior conjunctival flap. The skin wound is now closed with a few sutures. The operation is similar to that of Maxwell. If there is insufficient conjunctiva, what there is should be used for the posterior surface of the lid and a Thiersh graft used to form the posterior wall of the cul de sac. W. Z.

The Extirpation of the Palpebral Portion of the Lacrimal Sac.

AXENFELD, TH., Freiburg i. Br. (*Klin. Monatsbl. fuer Augenheilkunde*). This operation is nearly always performed according to the procedure of von Wecker. In many cases, especially in those in which this section of gland is rudimentary, the operation is difficult and unsatisfactory.

Axenfeld has devised a method which he believes to be greatly superior. He uses cocain or eusemin and adrenalin local anesthesia by hypodermic injection into the outer canthus. The lids near the outer canthus are then forcibly separated by blunt hooks placed above and below, disclosing the surface of the palpebral lacrimal gland. The mucous membrane is cut and dissected above and below, over the gland. The gland is grasped by a pair of forceps, applying some tension in order to grasp the major part of the gland as far back as possible, with a specially constructed Pean forceps. The gland can then be cut off with a scissors in front of the Pean forceps with no fear of bleeding or other complication, or the gland may be cut behind the forceps if desired. A suture is rarely necessary. F. K.

Extirpation of the Lacrimal Gland.

FRICKER, E., Gorlitz (*Klin. Monatsbl. fuer Augenheilkunde*, March, 1911), states that in Prof. Zimmermann's clinic in Gorlitz, the common practice is to associate extirpation of the lacrimal sac with removal of the palpebral portions of the lacrimal gland. This latter is facilitated by the introduction of a silk thread near the middle and 2 or 3 mm. from the free edge of the upper lid. When the patient looks down and in, the lacrimal gland is brought forward when tension is made on the suture up and in. The mucous membrane is separated with a von Graefe knife, the gland grasped with a forceps and excised with a pair of scissors. It is best to begin to separate the gland from the nasal side on account of severe bleeding from the lacrimal artery in some cases. F. K.

The Question of Palliative Trephining in Cases of Choked Disk.

HIPPEL, Halle, A. S. (*Klin. Monatsbl. fuer Augenheilkunde*, January, 1911), relates the histories of a number of cases of choked disk, followed by blindness, in which the patients lived and were fairly comfortable for six or more years. As early trephining will frequently retain sight for the patient, he believes that the treatment of individuals suffering from symptoms of cerebral pressure and choked disk should not be confined to mercurials and iodides, but that trephining should be done at an early stage. F. K.

Repeated Puncture of the Anterior Chamber.

ICHIKAWA, K., Osaka, Japan (*Klin. Monatsbl. fuer Augenheilkunde*, March, 1911). Repeated puncture of the anterior chamber for the cure of disease of the eye has frequently been attempted, with varying results. The author tried it in two cases of interstitial keratitis with poor results, and advises against the use of the procedure in corneal inflammations, though it might be of value in uveal disease. F. K.

Transillumination of the Eye.

Pflugk, Dresden (*Klin. Monatsbl. fuer Augenheilk.*, February, 1911), has devised a transilluminator which has interchangeable points permitting of the application of the point high up in the cul de sac. The long glass rod which transmits the light is covered to its tip with a metal cap.

W. Z.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

Clarence Loeb, M. D.,

ST. LOUIS,

AND

M. W. Frederick, M. D.,

SAN FRANCISCO.

The Treatment of the Conjunctivitis Falsely Called Diphtheric.

Eloui, Pacha, Cairo (Un mot sur le traitement des ophtalmies à fausses membranes, appelées sans raisons conjunctivites diphtériques, *Revue Générale d'Ophtalmologie,* 1911, Vol. XXX, p. 1), made daily subconjunctival injections of 1 cc. of antitoxin for 3-6 days and noticed an immediate amelioration. He claims the following advantages: (1) It does not scare the patient. (2) There is no danger of a general toxemia. (3) Its action is very rapid and sure. (4) Its action on the corneal lesions is more rapid and sure than when injected elsewhere. C. L.

Foreign Bodies in the Retina.

Vignol (Les corps etrángers de la retine, Thèse de Lyon, 1910; abst. in *Revue Générale d'Ophtalmologie,* 1911, Vol. XXX, p. 30) says that foreign bodies reach the retina either through the cornea or the sclera. They are usually metallic. They produce primary lesions consisting of wounds and hemorrhages, and secondary lesions consisting of pigmentation and often siderosis of neighboring and distant regions. There is often great retinal tolerance of the foreign body, to be followed later by a uveitis. With the ophthalmoscope the diagnosis is easy when the fundus can be seen, otherwise radiography must be resorted to, and this is not always successful. The treatment is extraction, preferably by the magnet.

C. L.

The Use of Large Probes in Disease of the Lacrimal Tract.

Simon (De l'emploi des sondes de gros calibre dans les affections des voies lacrymales, Thèse de Paris, 1909; abst. in *Revue Générale d'Ophtalmologie,* 1911, Vol. XXX, p. 43) says that probes of twice the size usually employed can safely be used, and with excellent results. Probes of large caliber have been used without bad results or complications. C. L.

The Palpebral, or Corneo-Conjunctival Reflex in Hemiplegia.

Meunier, C. H. (Le réflexe palpébral, ou mieux le réflexe corneo-conjonctival dans l'hémiplégie, Thèse de Paris, 1909; abst. in *Revue Générale d'Ophtalmologie,* 1911, Vol. XXX, p. 46), has examined twenty-eight cases, comprising (1) comatose, (2) noncomatose, and (3) old hemiplegics. In (1), the reflex was abolished on the paralyzed side, but present on the healthy. In (2), it was either abolished or decreased on the affected side. In a hysteric case, it was abolished on both sides. In (3), comprising six cases, it was abolished once, very much diminished twice, and normal or slightly diminished three times. C. L.

Nystagmography in Man.

Buys (De la nystagmographie chez l'homme, *Revue Générale d'Ophtalmologie,* 1911, Vol. XXX, p. 49) again describes his nystagmograph, and refers to the articles of H. Coppez and others interpreting the graphics obtained. The instrument of Buys registers all forms of nystagmus of whatever origin; also shows the modifications which it undergoes under treatment and during the tests. C. L.

The Estimation of Professional Ocular Capacity by the Visual Angle Limit.

Nicati, W. (Estimation de la capacité oculaire professionnelle d'apres l'angle-visuel-limite, *Revue Générale d'Ophtalmologie,* 1911, vol. XXX, p. 97), estimates that each enlargement of the visual angle by one minute represents a decrease in the professional capacity of 1/10. For example, a visual angle 8 minutes will represent a capacity of only 3/10, i. e., a loss of 0.7. The application is as follows: (1) Professional capacity is lost when direct vision is lost, i. e., when the patient must look sideways at an object. (2) The professional capacity equal 1/10 when the visual angle is 10 minutes, 2/10 when it is 9 minutes, etc. A visual angle of 1 minute is normal. (3) Each loss of 1 minute in the visual angle causes the loss of 1/10 of the professional capacity. (4) The professional capacity corresponds not to the angular space between two points, but rather to the distinction of points and characteristics in a given angular surface. C. L.

Epithelial Invasions of the Anterior Chamber.

Rameix (Invasion épithéliale de la chambre antérieure, Thèse de Paris, 1909; abst. in *Revue Générale d'Ophtalmologie*, 1911, Vol. XXX, p. 104) says that an epithelial invasion of the anterior chamber can give rise, in addition to iris cysts, to true cysts of the anterior chamber, of which the iris forms only one wall. They may appear months or years after the wound, manifesting themselves by phenomena of ocular irritation without objective symptoms; later by hypertension and glaucomatous manifestations. Treatment is evisceration of the eye. C. L.

Corneal Troubles Following Traumatism of the Eyeball.

Segal, J. (Troubles de la cornéa consécutif aux traumatismes du globe oculaire, Thèse de Paris, 1909; abst. in *Revue Générale d'Ophtalmologie*, 1911, Vol. XXX, p. 115), states that corneal contusions are usually produced by small blunt objects, and the resulting troubles are usually transient. They usually consist of a slight opacity, superficial, interstitial or deep, with some hypesthesia of the cornea, and a proportionate loss of vision. The lesion is sometimes permanent. Occasionally a corneal diathesis is produced. C. L.

Delayed Iridocyclitis Following Cataract Operation.

Duverger, C. (Des iridocyclites tardives apres l'opération de la cataracte, Thèse de Paris, 1909; abst. in *Revue Générale d'Ophtalmologie*, 1911, Vol. XXX, p. 118), divides the delayed iridocyclitides into three forms; the purulent, which almost always develops into panophthalmitis; the plastic, which has a malignant character, and which left to itself usually causes sympathetic ophthalmia; and the benign, with a tendency towards healing, but with the possibility of a glaucoma.

Endogenous infection is possible, but rare, in the purulent and benign forms; the sympathetic is never endogenous. The entrance of germs follows secondarily, due to the fistula formed by the interposition of tissue between the lips of the wound. A direct hernia is not necessary. C. L.

Ocular Lesions Accompanying Albuminuria Gravidarum.

Burnier, R., Paris (Des troubles oculaires au cours de l'albuminurie gravidique, *Gazette des Hôpitaux,* 1911, Vol. LXXXIV, p. 193), divides the ocular affections found in a pregnant woman into those without any exact fundal lesion, i. e., albuminuric amaurosis, and those with distinct lesion, i. e., retinitis albuminurica and neuritis albuminurica. The former usually affects primipara and occurs usually just before, during or after delivery. It appears suddenly, develops rapidly and may progress to complete blindness. The fundus is absolutely normal, but the pupils are often dilated and rigid. Usually the return to normal vision is as abrupt as the loss, but may take several weeks and be incomplete. The cause is probably a cerebral process whose nature and location is uncertain.

Retinitis albuminurica is found in pregnant women as a result of an acute nephritis gravidarum or as a complication of a true nephritis. Albuminuria may be lacking as a symptom, and the fundal lesion still be present. It is due to an infiltration of the retina by the elements of the blood, and is not a true degeneration of retinal fibers, which explains the prompt recovery when the cause is removed. The ophthalmoscopic picture is similar to that of ordinary albuminuric retinitis, and the loss of vision is usually gradual. Though the prognosis of this condition is good, provided the cause is removed, the atrophy of the nerve, the chorioidal changes and the detachment of the retina, which sometimes complicate the cause may leave the patient with a great loss of sight, even blindness. Recurrences in subsequent pregnancies are common.

Sometimes the retina is not affected, the trouble concerning then the optic nerve, either as a papillitis or a retrobulbar neuritis. The prognosis is good unless the fibers are compressed too long.

The treatment consists in routine examination of the urine, and ophthalmoscopic examination whenever albuminuria, headache, vomiting, etc., appear. In the transient amaurosis the gravid toxemia should be treated. In neuroretinitis albuminurica appearing in the first six months, it is necessary to cause abortion. But if it appears in the last three months it is a debated question, owing to the consideration of the life of the child. The author seems to believe that the life of the mother is the first consideration. He advises that the mother be told of the danger of the same condition appearing in case of a subsequent pregnancy. C. L.

"606" and Diseases of the Eye.

De Lapersonne, F., and Léri André (Le 606 et les maladies des yeux, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 2) do not believe that 606 exerts any evil effects upon the eye. The cases reported by Finger are lesions of syphilis and not of arsenic poisoning; they are produced in spite of and not because of 606. They report the results of twelve cases as follows: Iritis and iridochorioiditis, 7 cases; 3 showed excellent results, in a few days; one was improved in 8-9 days, but returned a month later with an iritis of the other eye. No result in the other cases. Interstitial keratitis, 3 cases; one greatly improved, two others not improved. Optic neuritis, one case; this was greatly improved for a while, but two months later had a severe relapse. Ocular paralysis, one case; temporary improvement. The cases are too few to make any exact conclusions, but the authors believe it will act favorably in simple iritis and interstitial keratitis. The treatment must be tried out, bearing in mind that it is far less dangerous than other arsenic preparations. C. L.

Malignant Leiomyoma of the Iris.

Van Duyse, Ghent (Leiomyome "sarcomatode," leiomyome malin de l'iris. *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 13), gives an extensive discussion of a case which he saw in a girl of 28, who presented herself with a whitish tumor of the right iris. There was a history of a spot in this location for twenty years. In April, 1908, there was a sudden loss of vision due to a hemorrhage into the anterior chamber, which disappeared in three days. Hemorrhages appeared, however, 10/08, 1/09, 9/09, 10/09, 11/09, 12/09 and 1/10. The last one was followed by a large iridectomy, which was followed by normal healing and perfect vision. Microscopically, the growth was seen to be composed of structure resembling smooth muscle fibers, with spindle-shaped nuclei. There was also present oval elements with large nuclei, but the muscle fibers predominated. Several cuts show the microscopic appearance of the sections. It was a fibromyoma, in its most recent part taking on the character of a sarcoma. A table of 10 cases and the bibliography conclude the article. C. L.

Ocular Tuberculosis and the Antitubercular Serum of Marmorek.

Verrey, A. E. (Tuberculose oculaire et sérum anti-tuberculeux, du Docteur Marmorek, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 34), discusses the cases previously published, and reports a case of bilateral interstitial keratitis of tubercular origin treated by rectal injections of Marmorek's serum, accompanied by general treatment. For a while the improvement was marked, but later an exacerbation appeared, but this was of short duration. The final result, as far as the vision is concerned, was good. C. L.

Traumatic Paralysis of the Motor Oculi.

Terrien, F. (Paralysie traumatique du moteur oculaire commun, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 49), reports a case of a man who three weeks before had been struck in the left eye by the point of an umbrella. This was followed by ecchymosis, slight exophthalmos and ptosis. Diplopia was present, whenever the lid was raised—homonymous in character, with extreme outward deviation of the eye. Medium mydriasis, no reaction to light or accommodation. Neuralgic pains in region of left trifacial. In three months the lesion was cured. It was probably a deep compression of the motor oculi at its emergence. C. L.

Postoperative Delirium in Cataract Operations.

David, V. (La délire postoperatoire chez les opérés de cataracte, Thèse de Paris, 1909; abst. in *Revue Générale d'Ophtalmologie,* 1911, Vol. XXX, p. 125), says that the delirium following cataract operations is only a variety of postoperative delirium. It begins very early, usually during the night, unaccompanied by rise of temperature, and usually appears in old people. The etiology is a predisposition, senility, autointoxication, darkness, mental impressions, stay in bed, etc. It usually takes the form of mania or melancholia. The prognosis is usually good, but the patient may strike his eye or pull off the bandage, thus causing an infection. C. L.

The Relation of the Hallucinations of Tabetics to Ocular Lesions.

Bouzegues, G. (Des hallucinations chez les tabétiques, leur rapport avec les troubles de la vue, Thèse de Paris, 1909; abst. in *Revue Généralé d'Ophtalmologie*, 1911, Vol. XXX, p. 138), claims that the hallucinations of tabetics are usually due to ocular trouble, especially lesions of the optic nerve and the resultant amblyopia. They generalize these hallucinations, because, unlike the blind from other causes, they are unable to correct them by the aid of their other senses. Thus they lead to melancholia and the belief in persecution. C. L.

The Sensory Complications of Meningitis.

Evreinoff (Les complications sensorielles des méningites, Thèse de Paris, 1909; abst. in *Revue Généralé d'Ophtalmologie*, 1911, Vol. XXX, p. 139) states that sensory complications are found in all forms of meningitis, but especially in epidemic cerebrospinal meningitis. The ocular complications consist of paralyses, nystagmus, inflammations and blindness. Ophthalmoscopically are found optic neuritis, optic atrophy, thrombosed retinal vessels, or even a normal fundus. C. L.

Medical Treatment of Cataract.

Terrien (Traitement médical de la cataracte, *Le Nord Médical*, 1911, No. 396, p. 76) advises that patients with diabetic cataract should be sent to Vichy and Carlsbad. In senile cataract he advises eye drops or eye baths of potassium iodid, in solutions of 2.5%. The baths may be employed 10-15 minutes. Subconjunctival injections of a 2% potassium iodid has also been used advantageously. C. L.

Exophthalmos and Acute Leucemia.

De Lapersonne, F. (Exophtalmie et leucémie aigue, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 65), describes the case of a girl of 16 years with a left exophthalmos, painless and irreducible. Palpation showed an indurated mass in the upper external part of the orbit, over which the skin was freely movable. Further inward were other indurated foci, which lay deeper. Outside of a slight tortuosity and overfilling of the veins the fundus was normal. Vision 0.5, not improved by glasses. Normal fields of vision. On the right side deep palpation revealed two small indurated masses. The blood examination showed a large leucocytosis and a predominance of myelocytes and polynuclear neutrophiles. The left exophthalmos increased, and the right eye also began to protrude. The general symptoms also became more aggravated. During treatment she was attacked by a severe case of grip, after which her parents removed her from the hospital, although she was in a very serious condition. C. L.

A Simple Means of Determining Latent Strabismus.

Terrien, F. (Remarques sur le fusionnement; moyen simple de détermination des strabismes latents, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 72), confirms the finding of Hirschberger and Bielschowsky that in the visual fields of strabismics there exist zones of psychic inhibition or regional exclusion. The normal eyes see an object as single, because the image seen by one eye is suppressed or neutralized. This is well shown by Helmholtz's experiment of the antagonism of the visual fields. He describes several other experiments to show neutralization. Based upon them, he advises the following test for latent strabismus: Upon the upper part of one of the orifices of a diploscope, e. g., the right, there is placed a small metallic tooth, which is movable. If there is heterophoria, the patient sees two orifices, in each of which is an O. If there is an excess of convergence, the one with the tooth will be seen to the right (homonymous). When there is insufficiency, it will be seen to the left (crossed). The position of the tooth thus indicates the kind of heterophoria.

C. L.

The Practice of Orbital Heteroplasty.

Bonnefon, G. (La pratique de l'hétéroplastie orbitaire. *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 89), describes the technic of the operation. A rabbit of medium size is chosen. It is killed by a blow on the neck, the palpebral orifice is enlarged, and the ball, with as much as possible of muscle and optic nerve, is removed and placed in a bowl of lukewarm water. Meanwhile the patient has been anesthetized. Each of the recti is grasped by a forceps, the eye is enucleated, and the hemorrhage is checked by tamponing alone. While the latter is being done, the rabbit's eye is removed from the water and placed, cornea downwards, on a piece of sterile gauze. A suture with two needles is passed through muscles and nerves horizontally, and another perpendicularly, both passing through the sclera at the place where the nerve pierces it. The cavity of Tenon's capsule of the patient is now cleansed with peroxide and dried. The rabbit's eye, cornea downward, is placed in the cavity and the needles are passed through the tendon of the corresponding side, and the sutures are gently tied with a double knot, so as to bring the ends of the corresponding recti into apposition. The conjunctiva is now completely sutured over this, and the field washed with peroxide. A lightly compressive double bandage is worn for the first three days, redressing every second day afterwards. The operation is an easy one, and the results are good. Bad results can follow only where there is lack of asepsis. C. L.

Transitory Ophthalmolacia (Collapsus Sclerae) in the Course of a Cataract Operation in a Diabetic.

Cantonnet, A. (Ophtalmolacie transitoire (collapsus scléral) au cours d'une opération de cataracte chez un diabétique, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 98), reports a case of florid diabetes with a hard cataract. Tension of the eye normal. Usual cocainization, after which time there was perceptible an "atrophic" aspect of the eye. Following the corneal incision there was a sinking in of both cornea and sclera, necessitating a rapid delivery of the lens, by means of Snellen's loop. Following the operation the patient was nervous and stupefied, but had no pain in the eye. The next day his general condition was very bad; he did not answer except by meaningless words. It was evidently a diabetic coma. The final outcome was good. C. L.

Varicosity of the Papilla.

Landolt, M. (Varicosités de la papille, double anastomose veineuse et artiérielle, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 104), describes a case who for two years had occasional attacks of dizziness. An attack having resulted in visual disturbance, he consulted Landolt, who found the right eye ophthalmoscopically normal, whereas the left showed an accessory filiform inferotemporal artery, the circulation being evidently greatly diminished. A short branch connected this with the normal superotemporal. There was no common venous trunk. The superior vein was dilated and showed a pulsation. From the inferior a short, tortuous, dilated branch ran upward. Its course paralleled the anastomotic arterial branch. Diagnosis, obstruction to the circulation, situated in the optic nerve. C. L.

Cystic Fibroma of the Optic Nerve Sheath.

Comninos, O., Smyrna (Fibrome kystique de la gaine du nerf optique, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 108), saw a girl of 17 with a right exophthalmos. By deep palpation in the infero-external part of the orbit a hard, non-fluctuating, almost immovable tumor was felt. By a Krönlein operation a cyst of the sheath of the optic nerve was removed, together with the nerve. The final result was good, except for a superior deviation of the eye due to an injury to the inferior rectus. C. L.

Decompressive Craniectomies in the Choked Disk of Intracranial Hypertension.

Velter, E., Paris (La craniectomie décompressive dans les stases papillaires des syndromes d'hypertension intracranienne, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 129), draws attention to the transitory loss of vision which frequently accompanies choked disk, and which should at once lead to intervention. After a long article illustrated with numerous case histories, he draws the following conclusions:

1. In choked disk it is necessary to perform decompression after having tried mercury and lumbar puncture, but these latter should not delay the former too long.

2. The operation should be early and performed as soon as the stasis is seen to be progressive. The visual result will be better, but it is never too late to operate, even in complete blindness.

3. The operation should be a rapid one, and is best performed by the instruments devised by Dr. Martel.

4. If there are any localizing symptoms the operation should be performed in the region thus indicated, otherwise it should be performed in the parieto-temporal or right subtemporal region. The occipital region is the ideal one, but there are technical difficulties and there is danger in tumors of the cord and medulla.

5. It is better not to incise the dura at first, thus avoiding hernia cerebri. If a second operation becomes necessary, the incision can then be made.

6. After the operation the symptoms rapidly subside, vision and the field increase, the stasis diminishes, though it may persist for some time, gradually disappearing.

7. Complete cure is obtained only in cases operated early, before atrophy has set in.

8. Though decompression always relieves the patient, the operative prognosis and the visual prognosis vary according to the case and the cause of the hypertension. C. L.

The Jaw-Winking Phenomenon.

Gaultier, R., and Bucquet, A. (La mâchoire à clignements, etc., *Gazette des Hôpitaux*, 1911, Vol. LXXXIV, p. 732), report a case of the above in a man 55 years of age. The patient a few days before, awoke with a "congested" feeling and a cold feeling over one-half of his head and the left side of his body. At the same time it was noticed that mastication was accompanied by winking. Examination showed a slight left ptosis, which was easily overcome by the patient. Movement of the jaw was accompanied by a quick contraction of the levator of the left lid. The authors explain the case by the assumption that there is always a movement of the lid accompanying the movement of the jaw, which is ordinarily counteracted by the action of the antagonists, i. e., the orbicularis palpebrarum. When this is paralyzed, as in this case, the associated movement becomes manifest. C. L.

The Structure, Pathogeny and a Modified Operation for Pterygium.

Terson, A. (Sur la structure, la pathogénie et une opération modifiée du pterygion, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 161), states that a complete pterygium is composed of a relatively normal epithelium covering a tissue composed of conjunctival and sclerosed elastic fibers. These tissues are more abundant in the head. It probably arises in some cases from a pinguecula, but there are cases where the pterygium passes through and fragments the pinguecula. Nor are open air and hot sunlight always the exciting cause. His operation consists in local anesthetic after which the pterygium is seized near the caruncle and the base cut vertically. From the upper and lower ends of the incision a horizontal incision is made towards the cornea, the upper incision always in the region of the third of the cornea. The head is carefully dissected off, carefully curetting and cauterizing afterwards. A rectangular area is thus exposed. The lower conjunctival flap is loosened, drawn upward and sewed to the upper. C. L.

The Pathogeny and Treatment of Trachoma.

Jacovidès, Alexandria (Un mot sur la pathogénie et le traitement du trachome, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 172), does not believe that the specific germ of trachoma has yet been isolated. The treatment can be divided into three classes: (1) medicinal, (2) surgical, (3) mixed. He prefers the last, scarifying the fornix, combined with digital expression. This is followed by a curettement until the tarsus is felt. Then comes lavage with some antiseptic fluid, followed by yellow oxid ointment and bandaging for two hours. Then the eyes are washed every two hours to get rid of the secretion. For the following 6-8 days silver nitrate 2% is applied until the secretion disappears. This is followed by a 1%-2% solution of copper sulphate in glycerine. The author has had better results with this treatment than with any others. C. L.

Encephalocele with a Mixed Fibrogliomatous Structure.

Comninos, O., Smyrna (Encéphalocèle a structure mixte fibro-gliomateuse, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 177), removed a tumor from the forehead of a girl fourteen years of age. It had existed since birth, and had increased in size. Microscopic examination showed that it was a congenital encephalocele composed of fibrogliomatous tissue. A portion of the brain had probably been separated from the main mass and had ruptured, after which the tissue had cicatrized, leaving the cyst independent of the cranial cavity. C. L.

Primary Sarcoma of the Iris.

Goldchtein (Le sarcome primitif de l'iris, Thèse de Paris, 1909; abst. *Revue Générale d'Ophtalmologie,* 1911, Vol. XXX, p. 162), after a detailed review of the literature up to 1908, draws the following conclusions: Primary sarcoma of the iris is very rare, appearing preferably in the second half of life and in females. There are four steps in its evolution: Appearance of the iridal nodule, glaucomatous period, early invasion of the limbus, generalization. They may be either round or spindle celled, pigmented or not. The diagnosis is difficult from melanoma, gummi and tubercles, but the prognosis is good on account of its slow evolution and the possibility of early intervention. Iridectomy is insufficient. Early enucleation is the only safeguard against return and metastasis. C. L.

The Neuroretinal Determination of Myeloid Leucemia.

Carlotti (Les déterminations neurorétiniennes de la leucémie myeloide, Thèse de Paris, 1909; abst. *Revue Générale d'Ophtalmologie,* 1911, Vol. XXX, p. 165) says that the ocular lesions of myeloid leucemia are especially neuroretinal, rarely chorioidal. Visual troubles are not distinct, though they may be among the earliest manifestations of the disease. The nerve is infiltrated, its borders are enlarged, but the fibers are intact. The retinal veins are very dilated, and there are hemorrhages in the inner layers. The chorioid may be thickened due to dilation of the vessels, but there are no hemorrhages. Radiotherapy seems to have only an indirect influence on the evolution of the lesions. C. L.

Syphilitic Osteoperiosteitis of the Orbit.

Chaigneau (Contribution à l'étude des osteoperiostites syphilitiques de l'orbite, Thèse de Paris, 1909; abst. *Revue Générale d'Ophtalmologie,* 1911, Vol. XXX, p. 182) claims that these lesions are more frequent than supposed, both of the hereditary and acquired types. The tertiary lesions are very rebellious to treatment, insidious in evolution and more destructive than other varieties. They take on a malignant type when the syphilitic basis is not treated. Even when no history is obtainable, a course of mercurial treatment should be instituted. C. L.

The Prognosis of Glioma Retinae.

Carlo, E. (Le prognostic des gliômes de la rétine, Thèse de Paris, 1909; abst. *Revue Générale d'Ophtalmologie,* 1911, Vol. XXX, p. 165), claims that the prognosis is not always fatal, but depends on the malignancy of the tumor and the precocity and radical nature of the enucleation. If the nerve is invaded the orbit must at once be exenterated. If it is atrophied, without microscopic involvement by the tumor, the prognosis must still be guarded. Bilateral affection makes the prognosis graver, but a fatal outcome does not invariably follow. C. L.

Extirpation of the Orbital Lacrimal Gland in Epiphora.

Frogier (De l'extirpation de la glande lacrimale orbitaire dans le larmoiement, Thèse de Paris, 1909; abst. *Revue Générale d'Ophthalmogic,* 1911, vol. XXX, p. 182), states that in intractable epiphora it is necessary to extirpate the orbital lacrimal gland, which is an easy operation, and to be preferred therefore to operation on the palpebral glands. C. L.

The Treatment of Excretory Troubles of the Lacrimal Apparatus.

Jocqs, R., Paris (Sur le traitement des troubles excréteurs des voies lacrymales, *La Clinique Ophtalmologique,* Vol. XVII, January, 1911, p. 1), gives us the impression that most of the French oculists think as many of our oculists, that the best thing to do with a case of lacrimation is to send it to one of your enemies. This is due, he writes, to the adherence to the obsolete, painful and barbaric way of treating all these cases with slitting of the canaliculi and passing of large probes. Already in 1891 Gillet de Grandmont protested against this method and spoke in favor of antiseptic injections through the dilated lacrimal points and the use of very small probes; this view was adopted by Bourgeois in 1893, who added the fact that most of the strictures in the lacrimal apparatus are in the lower canaliculus, especially at the common entrance of the upper and lower canaliculus into the lacrimal sac. To overcome this he proposed enlarging the canaliculus with a lacrimotome, in manner similar to the enlarging of the urethra with an urethrotome. While many of the oculists have abandoned the use of very large probes, there are very few of them who seem aware of the fact that but an exceedingly small number of cases (6-7%) present an obstruction having its seat in the nasal canal, and that it is therefore useless to resort to the painful probing of the nasal duct. Jocqs asserts that in 90 out of 100 cases dilating the lower canaliculus from the punctum into the sac will stop the tearing, but he does not share the views of Grandmont and Bourgeois as to the infectious nature of the trouble, and therefore considers the use of antiseptic injections unnecessary. He thinks the origin of most lacrimal troubles may be found in a contraction or a paresis of Horner's muscle, and divides lacrimal troubles into four phases.

Phase one: Paresis or contraction.—This is manifested by eversion of the lower lacrimal point. The fibres of Horner's muscle surround the mucosa of the canaliculi and constitute its support. When a paresis of these fibres ensues the lacrimal points are no longer directed towards the globe and they no longer dip into the lacrimal lake to take up the tears. The tears, consequently, collect at the inner canthus, flow over on the cheek, and soon give rise to a dermatitis which increases the eversion. The treatment of eversion of the point is very simple; all that is required is vertical galvano-cautery of the conjunctiva, starting a little away from the punctum and carrying the cautery point well into the conjunctival sac. Jocqs has often observed that tearing is preceded by clonic spasm of the lid.

To determine the seat of the stricture an injection is made through the lower point; when the liquid returns through the upper point this should be taken to indicate a stricture at the common mouth of the ducts, but not in the nasal part of the duct. If the fluid returns through the lower duct the stricture is to be sought in the lower canaliculus. The treatment is very simple, consisting in dilating the canaliculus with the conical probe, which is pushed in until it is felt to strike the wall of the orbit; this is followed by an injection at the same time or on the following day. If the fluid passes into the nose the stricture has been reduced. It is well to pass a number 2 or 3 probe for several days, and in a short time the tearing will cease.

Phase two: Catarrh of the sac.—In this phase rapid results are often obtained by the same treatment: catheterizing the lower canaliculus and injecting antiseptic fluids. Even though the fluid does not pass at the first sitting it can be made to pass at subsequent sittings. The obstruction in these cases is often in the upper end of the nasal canal, which again shows the fallacy of probing the nasal duct in its entire length. Slitting the canaliculus should again be avoided, only probes which can be passed through the dilated punctum being used. Should it prove impossible to make the fluid pass after several trials, then catheterizing the nasal duct will have to be resorted to. This should be preceded by the instillation of a few drops of a $\frac{1}{2}$ per cent solution of cocaine, and followed by a carefully made injection of a solution of protargol. Two or three catheterizations will generally be found to be sufficient, but these latter cases must be kept under observation for a long time. What causes the catarrh of the sac is a matter for discussion. Jocqs is inclined to think that it may be due to the absence of the tears which exert an antiseptic action, either chemical or mechanical, on the walls of the sac.

Third phase: Dilatation of the sac.—Here excision of the sac might be practiced, but Jocqs is in favor of the more conservative way of incising the sac, catheterizing the ducts through the incision, carefully cauterizing with chloride of zinc. In this way the normal condition of the sac may be reestablished and the tears be taken care of in the normal way.

Fourth phase: Tumor of the sac, Dacryo-pericystitis.—Even here Jocqs favors the conservative treatment. After incising and washing the sac it is cauterized on the following day with a 50% solution of chloride of zinc and the canals catheterized through the incision. The cavity is then filled with gauze, and allowed to close by granulation, which takes about three weeks. Thus a passage is preserved for the tears, and an almost normal condition reestablished.

This same treatment will be found efficacious in the treatment of true fistulas of the lacrimal sac, which never show a tendency towards healing.

Should it become necessary to destroy the accessory lacrimal gland in cases that have been under treatment with slitting of the ducts and the passage of large sounds, Jocqs practices the actual cautery of the gland, as done by de Wecker. The gland is seized in a special forceps, the mucosa stripped back and the cautery point plunged well into the gland. In about three weeks there will be but a small nodule to mark the site of the former gland. M. W. F.

The Abortive Treatment of Incipient Cataract.

Dor, L., Paris (Le traitement abortif de la cataracte commencante, *La Clinique Ophtalmologique*, Vol. XVII, January 1911, p. 10), acknowledges that the treatment of incipient cataract, as indicated by Badal, with eyebaths with a 3% solution of potassium iodid, has not found much favor, but he believes that his modification of that method is well worthy of a trial, as he professes to be able to arrest the development of incipient cataract in 8 cases out of 10, to cure one case absolutely, and to have but one failure. By incipient cataract Dor means those cases in which the vision is still 1/2, and in such cases the vision can be advanced to normal in three months, with a return of accommodation corresponding to the age of the patient. The striæ which are visible in the periphery of the lens do not disappear, but they do not progress. Dor thinks that it is the striæ which are in process of formation, and cannot yet be detected as opacities, that clear up and restore the visual acuity. In most cases that apply for treatment the vision has already sunk to 1/4. In these the vision can be raised to 1/2, but rarely to 1/1, and in such cases improvement only is spoken of. In many cases the further advance of the opacities is arrested, and this is notably the case with secondary cataracts, or those of a congenital form.

Dor thinks that opacification of the lens is brought about by a ferment which passes from the blood into the aqueous humor. This ferment is "hydrating," and causes a hydration of the albumins in the lens. The object of the treatment is to overcome the action of this ferment, and it is a matter of experimentation to determine which chemical will do this. After trying iodid of potassium and soda, chlorid of calcium, chlorid of magnesium, carbolic acid, resorcin, salicylate of soda, borate of soda, and benzoate of lithium, he found that the only one that was useful in this direction was resorcin. The most effective solution was found to be the following:

Sodium iodid dessicated	5.00
Crystallized chlorid of calcium	400.00
Distilled water	400.00

This solution must be prepared from recently crystalized, very pure salts, that have been kept from light and moisture, and under these conditions the solution will be found non-irritating.

It should be used in an eyecup, each eye being bathed for half an hour daily. In order to avoid the painful pressure on the periorbital region and the evaporation of the fluid, Dor has had soft rubber rings fitted to the edge of the eyecups. The solution is used warm, and for delicate patients is rewarmed at the expiration of the first 15 minutes. The lids are kept open, and winking is not necessary, as it is not a part of the treatment to have the fluid pass through the lacrimal apparatus. This treatment is kept up for three to six months and then a pause of several months is made, after which the treatment is resumed. In the interval an ointment of resorcin, 0.10; lanolin, 20.0; water, 2.0, may be used, being placed in the conjunctival sac on retiring.

Of 50 patients who have been treated in the foregoing way 5 have been cured and have stopped all treatment two years ago, as they have no trouble in reading. Forty are still under intermittent treatment, and acknowledge the benefit they have already received.

The treatment is well adapted for those cases in which there is lenticular myopia or a presbyopic state far beyond the age of the patient, as these conditions are often the forerunners of cataract. M. W. F.

Double Lens for Magnifying and Illuminating.

Armaignac, H. (Bi-loupe à grossissement et éclairage lateral simultanés, *La Clinique Ophtalmologique,* vol. XVII, February, 1911, p. 69), showed before the Ophthalmological Society of Paris two convex lenses of 12 to 15 diopters mounted at either end of a shank in a universal ball and socket joint, which allowed the lenses to be placed in any relative position desired. The shank, to judge from the illustration, is about two inches long. Through one lens the light is thrown on the cornea, and through the other the foreign body which one is trying to remove or the part one wishes to examine is magnified. After the lenses have been placed in the desired position and the screws set the whole apparatus can be held in the left hand which is steadied against the face. Thus the right hand is left free to operate, and an assistant is unnecessary. The lenses can also be used to examine the fundus in the indirect method. M. W. F.

A Case of Double Collapse of the Sclera.

Boulai, J., Rennes (Un cas de double collapsus de la sclérotique, *La Clinique Ophtalmologique,* vol. XVII, February, 1911, p. 71), removed the cataractous lens from the left eye of a man aged 50, who showed a profound arthritic diathesis. Boulai has been in the habit of instilling 8 to 10 drops of a 2% solution of cocaine in three stages, at intervals of 3-4 minutes, the toilet of the eye being performed in the meantime. This same solution was used in the case described. The corneal incision having been made with a Graefe knife, there was a seemingly normal issue of aqueous, but the cornea immediately showed a cup-shaped depression, the corneal flap folded on itself and became cloudy. While the anterior capsule was being opened the globe seemed to soften and flatten. Some soft masses appeared in what was left of the anterior chamber, but nothing resembling vitreous was seen. After waiting a few moments the lens was delivered and also a part of the soft mass. The eye was bandaged in the ordinary way, but neither mydriatic nor miotic was used. When the bandage was changed on the following day the eye appeared normal in every respect, but, as a matter of precaution, the ocular tension was not determined. On the fifth day there was great pain, the patient acknowledging that he had stuck his finger in the eye during the night. There ensued a mild iritis which left a number of posterior synechiæ, necessitating a superior iridectomy five months after the first operation. The results were excellent.

Two years later the other eye was ready for a cataract extraction, and especial care was taken to guard against accidents. Nevertheless, the collapse of the globe was even more marked than in the left eye. In spite of this an iridectomy was performed immediately after the corneal incision had been made, and the rather large nucleus extracted without using Snellen's loop. There was much less of the soft masses than in the other eye. The results were of the very best; the patient took good care to guard against accidents in this eye, and two years after this second operation both eyes were doing splendidly.

Boulai hesitates to accept L. Dor's explanation of this phenomenon, that the vitreous is partly liquefied and is expelled under the guise of aqueous humor, as the amount of aqueous expelled was about normal in both eyes. He is rather inclined to think, with LeRoux, that there is some pathologic condition

of the eye structures which interferes with the nutrition of the lens. The patient in this case was only 50 years of age, and in all probability the opacification of his lenses had been going on for some time. Perhaps the high arterial tension might account for it. The remarkable part of both his and LeRoux's case is the splendid results after what seemed an alarming accident.
M. W. F.

A Note on the Treatment of Parenchymatous Keratitis.

Kaz, R., St. Petersburg (Quelques mots sur le traitement de la kératite parenchymateuse, *La Clinique Ophtalmologique,* vol. XVII, p. 170), gives his treatment of this condition as follows: If there is irritation he begins with a collyrium of cocaine muriate, 0.20, corrosive sublimate (1-5.000), 10.0, of which three drops are instilled every three hours. With this it is often possible to abort the disease. Should the condition not have improved in two days he resorts to a 1% solution of pilocarpin, once or twice a day; if there is no irritation present at the outset he begins with the pilocarpin. Should the keratitis persist after several days an ointment of xeroform (5-10%), with 1% cocaine is used at night, 5-10% dionin twice a week, and iodid of iron or of potassium internally. Should the irritation, photophobia and tearing still persist, or should they be present at the outset, recourse is had to mercurial frictions, and atropin is used to prevent iridial complications notwithstanding the evil influence it has on the corneal process.
M. W. F.

A Case of Glaucoma.

Le Couedic, Guingamp (Notes sur un cas de glaucome, *La Clinique Ophtalmoligique,* vol. XVII, p. 172), relates the case of a woman aged 48, with the history of an iritis 8 years previously, with a well defined attack of glaucoma in the right eye, and a painful swelling of the wrists, knees, and fingers. The left eye beyond a slight contraction of the visual field, shows no glaucomatous symptoms, although she has already experienced a lessening of the vision and halos in connection with a former attack. As the patient objected to an operation leeches were applied to the temple and general measures instituted to lower the blood pressure. In a month the attack had passed off, and the vision of the right eye had risen from 1/4 to 2/3. Six months later she had another attack, but this time the left was involved also, and when the attack had subsided in six weeks, there was still some hypertension in the left eye. The third attack, which came on after another six months, affected the left eye only. The following morning the patient had an edema of the entire face, and the eye pains had subsided. The following month she had edema of the lungs, relieved by copious bleeding. Three months later another attack of glaucoma on both eyes, especially severe on the left eye. A leech was put on the left temple, the next morning there was an immense swelling of the face and neck, which took days to pass off under cold compresses. The vision of the right eye was 1/2-1/3, that of the left 6/6.

We have here, in an arterio-sclerotic subject, a remarkable example of the influence of a collateral edema on the glaucomatous process. This illustrates the part which local troubles of circulation play in the production of specific osmotic phenomena. To vary an old aphorism one might say: "There is no glaucoma; but there are glaucomatous subjects." M. W. F.

Migratory Sympathetic Ophthalmia Transmitted to the Monkey and the Rabbit. Results of Treatment with "606."

Darier, A., Paris (Ophtalmie sympatique migratrice transmise au singe et au lapin. Tentatives therapeutiques avec le 606, *La Clinique Ophtalmologique,* vol. XVII, May, 1911, p. 226), after reviewing the recent experimental work of F. Deutschmann, etc., gives as their collective opinion that sympathetic ophthalmia is a lymphangitis, which spreads by continuity of tissue from one eye to the other, and the proper name for this process is migratory ophthalmia. He mentions the case of Siegrist, in which, although the Wasserman reaction was negative, an improvement of the vision from 0.15 to 0.90 took place after the first injection of 0.30 salvarsan. Fleischer and Flemming's failures with the same remedy are explained by insufficient dosage. In the absence of more definite knowledge concerning the active agent he thinks we may assume some kind of spirillum as the cause of migratory ophthalmia. M. W. F.

Opticociliary Neurotomy or Isolation of the Eye.

Dianoux (De la névrotomie optico-cilaire ou isolement de l'oeil. *La Clinique Ophtalmologique,* vol. XVII, May, 1911, p. 231), the veteran of 200 neurotomies, breaks a lance to keep this operation from sinking into oblivion, as he thinks it is a really valuable part of our armamentarium against sympathetic, or migratory, ophthalmia. He combats the points raised against it under the following headings:

1. The operation is not a difficult procedure, calling only for a cool head and a moderate amount of surgical skill. It is not given to all to be surgeons.

2. Profuse hemorrhage can be avoided by operating from the inner side. After denuding the globe as far as the optic nerve, the latter may be cut or resected after picking it up on a hook, and thus the posterior ciliary and the central retinal arteries are the only ones cut. The amount of bleeding varies as in an enucleation, and may be controlled by the use of adrenalin, although Dianoux has never used it. He prefers to make compression with the replaced globe. If one attacks the nerve from the outer side he runs the risk of cutting the ophthalmic artery and numerous veins, but even then Dianoux never was compelled to enucleate at once.

3. If the muscle or its tendon is correctly reattached to the globe there never is any danger of a malposition of the globe.

4. The occlusion of the lids should be perfect to prevent corneal sloughing from the bandage. The bandage should be continued for a week, at the end of which time the cornea has resumed its sensibility.

5. The main point is whether neurotomy does prevent migratory ophthalmia. Theoretically an eye capable of injuring its fellow should be put out of commission. For this there are three procedures: enucleation, evisceration, and enervation, or isolation. Enucleation removes the danger by removing the organ. Evisceration amounts to almost the same, as it is in reality merely a discrete enucleation. Enervation separates the eye from all its vascular and nervous connections, excepting the ciliary arteries and veins coming from the superior, external and inferior recti. The anastomoses of the orbital branches with the conjunctival plexus are the only nerves left unsevered, and the lymphatics are all obstructed. Thus isolated the eye would surely become necrotic, did it not receive nourishment after the manner of a graft, as the rabbit eyes which Lagrange introduces into the capsule of Tenon after enucleation, do. The eye, which is thus attached by half of its

conjunctiva and the three recti tendons, can no longer be a menace to its fellow, as even a poetic imagination could hardly conceive of noxa finding their way through all these tortuous and interlacing conjunctival and palpebral veins.

Isolation preserves the globe; even when prothesis becomes necessary the movements of the artificial eye are the best possible. Besides, the consent of the patient to isolation is much more easily obtained than to an enucleation. Neurotomy does not change the subsequent behavior of the eye; if atrophy has begun it will continue, and an already existing leucoma will persist. M. W. F.

Idiopathic Ciliary Neuralgia.

Moncorge, Mont-Dore (La névralgie ciliare idiopathique, *La Clinique Ophtalmologique,* vol. XVII, May, 1911, p. 243), gives a good picture of this affection, which most oculists ignore or treat summarily, because of its rebelliousness to treatment. The commonest objective symptoms are: Swelling of the lids, conjunctivitis and blepharitis more or less marked, tearing, photophobia, and sometimes spasm of the adjoining muscles. In the form to which Moncorge wishes to call attention, these objective symptoms are wanting, but the subjective symptom, pain, is present in all gradations, from the simple sensation of sand in the eye and heaviness of the lids, through the feeling as though the eye had been bruised, to the grinding, tearing pain and the feeling that a redhot iron has been thrust into the tissues. The patient, as a rule, complains of "headache" and consults a general practitioner, who treats him for "cephalalgia," and thus these poor people pass many years in misery.

The pain is at times on the nasal side of the globe, with irradiation into the nose; at times in the anterior pole of the eye, radiating into the frontal region; in both these cases the pain may be associated with infraorbital neuralgia. At times the pain has its seat in the posterior pole of the eye, spreading thence to the occiput and neck. Most often it is observed on the temporal side of the eye, accompanied by vasomotor phenomena on the part of the temporal artery, which is sometimes markedly dilated, and again so constricted as to be barely felt. There is nothing fixed about the seat of the pain, which may remain the same for several days, or be changed several times during the same day. Generally the pain is unilateral, but when it becomes severe the tendency is towards bilaterality. The right eye is mostly the only, or the principal, seat of the pain.

The pain comes in attacks lasting from several days to several weeks, and showing more or less marked exacerbations. Sometimes the violence of the attack is so great, and the sensation of a gimlet boring into the head, or of the eye being torn out or burnt, is so extreme that the patient cries out in agony. When the pain is this severe the radiation is so many-sided as to form a regular helmet of pain. As a rule these attacks come on during the daytime, but they may occur at night, and sleep does not dispel them.

The seat of the pain is not hard to find, and occupies a small area. Tension is sometimes slightly plus, but this varies from one attack to another. Vision is undisturbed, likewise the pupillary reflexes. When the attack has passed the eye feels bruised. One prominent feature of this disease is its long duration, as much as 33 years having been noted. Men seem affected by it more than women. Its distinguishing trait is seat of the pain in the eye itself; this will prevent confusion with the many other neuralgias which occur in that region. It is not due to errors of refraction, as it has been noted in those whose errors had been carefully corrected as well as in those whose refraction was normal. Nor can copopsia be blamed, as the attacks may occur during profound sleep; or, when present, may disappear while the eyes are being used to their fullest extent.

Ciliary neuralgia, in common with the other neuralgias, is the expression of a constitutional dyscrasia. Its seat frequently brings it to the attention of the oculist, thus proving the necessity of the oculist being a good all-around man, as well as a specialist. The patients affected with ciliary neuralgia show, as a rule, hereditary stigmata of rheumatism and arthritis, and have personal arthritic antecedents. They are dyspeptics, sufferers from hemorrhoids, or entero-neuroses, and have had various arthralgias, myalgias, and other algias. They are the victims of the prolonged autointoxication which, in the modern school, is the foundation for the arthritic dyscrasia, which, in turn, bears a strong resemblance to the ciliary neuralgia of paludal origin. In one patient ciliary neuralgia followed an intercostal neuralgia which had existed continuously for three years, and disappeared suddenly when the "headache" made its appearance. Subsequently this same patient had lumbago, sciatica, and inflammatory swelling of various joints. Another patient obtained relief from his ocular pain only during an attack of mucomembranous enterocolitis. The same causes that bring on attacks of "rheumatism" in other parts precipitate the crises of ocular neuralgia, namely: changes in the weather, snow, rain, windstorms, etc.

Another proof of the constitutional basis of this ocular neuralgia is the mental aura observed in some cases. A patient, who, on awakening, feels depressed and incapable of mental exertion, paraphasia, etc., is sure to have an attack of ciliary neuralgia before night, with a disappearance of all the mental symptoms.

Against this condition, which may be truly said to spoil the life of the sufferer, therapeutics seem of little avail. The analgesics, alteratives, electricity, etc., bring the patient no relief. The only deliverance seems to lie in the employment of hygienic, hydrotherapeutic and dietetic measures, and even then the relapses are disheartening. M. W. F.

Fluorescin, Pyoktanin, Dionin, and Scarlet Red.

Darier, A., Paris (Fluoresine, pyoctanine, dionine et rouge ecarlate, *La Clinique Ophtalmologique,* vol. XVII, May, 1911, p. 254), deplores the fact that so many oculists do not avail themselves of the diagnostic help afforded by fluorescin in corneal lesions. He employed a double stain of fluorescin and 1/1,000 pyoktanin. Contrary to some observers he pretends that the color takes better if the eye has been previously cocainized.

He uses scarlet red in all cases where there has been loss of corneal epithelium or of conjunctiva. In wounds of the cornea, infected ulcers, dendritic keratitis, and burns of the cornea and lids it brings about rapid cicatrization. Instead of the usually employed 5% ointment with vaseline or axungia porci he uses an aqueous suspension prepared by triturating 0.50 scarlet red with a few drops of ether, and adding, after evaporation, gum tragacanth 0.30, glycerin 12.0, water 10.0. This mixture is thoroughly triturated, and a piece the size of a grain of wheat applied to the wound with a glass rod. M. W. F.

Removal of the Iris in Absolute Glaucoma.

Bey, Sameh, Cairo, Egypt (L'arrachment de l'iris dans le glaucome absolu, *La Clinique Ophtalmologique,* vol. XVI, December, 1910, p. 597), conceived the idea of tearing out the entire iris through an accident which happened as he was about to practice an iridectomy on a girl of 12, who was suffering with secondary glaucoma due to a leucoma adherens. A sudden movement of the head caused him to tear out the entire iris. The results were excellent, the pain never returned, the globe recovered its shape, and the tonus became normal. In the five years following he repeated the operation on 171 eyes, with highly satisfactory results. The cases were divided into 44 of absolute glaucoma, 11 of fulminating glaucoma, 48 of glaucoma secondary to leucoma, and 68 of staphyloma. In some cases partial iridectomies had been done without affording relief. M. W. F.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

V. L. RAIA, M. D.,

PROVIDENCE, R. I.

A New Rational Method for the Treatment of Entropion and Trichiasis of the Superior Lid.

PICCALUGA, FRANCESCO, Turin (*Annali Di Ottalmologia*, 1901, No. 1). The tarsal cartilage, which constitutes the skeleton of the lid, has an upper margin adherent and fixed to the tendon of the levator palpebræ superioris and fasciatarso orbitalis, a free border, an anterior convex surface and a posterior concave surface. At the union of the upper three-fourths with the inferior one-fourth of this latter surface an acute angle is seen with the apex directed posteriorly (the subtarsal angle) and which becomes more acute in entropin and trichiasis. The cicatricial contraction of the tarsal conjunctiva in trachoma acts more on the free border of the tarsus than on the adherent margin, this latter being fixed to the tendon of the levator palpebræ superioris and the fasciatarso orbitalis. The ciliary margin consequently turns in and entropin is produced. But the cicatricial contraction of the conjunctiva is not the only factor, although this is the most important. The cicatricial contraction of the tarsus itself, the spasm of the orbicularis muscle due to the inflammatory irritation of tarsus, and the blepharophimosis powerfully contribute to the incurvation of the free margin of the upper lid toward the eye globe. The new operative process of our author combines tarsectomy with external pressure in an opposite direction of the curvature of the tarsus. The operation is better understood by the aid of the accompanying, sagittal sketch of the upper lid, a and b. An incision c (fig. A) is made parallel to the margin of the lid at 3 mm. above the same from one angle of the eye to the other, then another b (A) 2 mm. above c (A) of the same length. The lower flap cd is separated from the tarsus beyond the ciliary implantation without cutting that delicate tract of skin which separates the cartilage from the skin and muscle at the free border of the lid, then similarly the upper flap ba (A) is separated beyond the implantation of the fascia-tarso orbitalis and the tendon of the levator palpebræ superioris. Where the cartilage shows its maximum of incurvation, tarsectomy e (A) is performed comprising with it also the corresponding conjunctiva.

The last stage of the operation consists in the application of proper sutures. These are ordinarily four of silk with a curved needle at each end and applied at equal distance. One needle

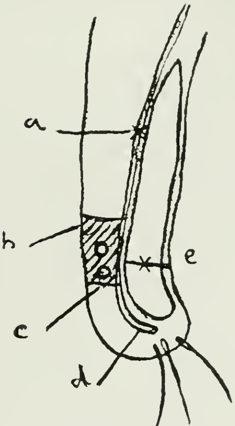

fig A.

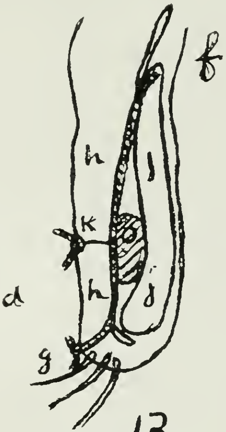

fig B

of a suture is thrust through the upper part of the tarsus and the implantation of the levator tendon and fasciatarso orbitalis f (B), passed between the upper and lower detached cutaneous and muscular flaps and the anterior surface of the cartilage and made to emerge in front of the implantation of the lashes at g (B). The other needle of the same suture is similarly passed from above below at one mm. distance from the first one, thus making a regular loop which is tied on a small bead g (B). There will be four of these loops put at equal distance one from the other as it can be easily understood. As the figure B shows the sutures must pass not only between the tarsus and the upper and lower flaps of the lid jj hh (B), but also in front of the musculo cutaneous area o o (AB) which covered by the flaps hh (B) acts on the convex part of the incurvated cartilage and by its pressure everts it. The operation is finished by uniting the margins of the wound c b (A) by means of interrupted or continuous sutures k (B).

Dr. Piccaluga says that this operation is specially adapted for advanced degrees of complete entropion and trichiasis of the upper lid.

The tonometer of Schiotz and the sphygmomanometer of Riva-Rocci for the determination of the ocular tension in relation to the blood pressure in normal and pathologic subjects.

Ruata, Vittorio (*Archivio Di Ottalmologia,* January, 1911). Many are the tonometers on the market to measure the variation in the intraocular tension, but for practical and clinical purposes none is so valuable and precise as that invented by Schiötz. Important researches have been made with the aid of this instrument, especially in glaucoma, and these have elucidated many facts which otherwise would have remained unknown. Schiötz puts the average intraocular pressure in normal eyes between 15.50 mm. Hg. and 25 mm. Hg., while our author finds it little lower. This is the consequence of the climate and the difference of food between northern and southern people. The intraocular pressure is in strict relation to the blood pressure, and any cause that increases this latter produces an elevation in the former. Cold, prevalent meat diet, alcoholic drinks, etc., increase the intraocular pressure, while warm temperature, profuse perspiration, vegetable diet diminishes it, as it is the case in southern Europe, and especially in Italy, where Ruata has conducted his experiments. In doubtful cases of moderately increased eye tension, if the blood pressure is normal or even diminished, glaucoma must be suspected, while if it is correspondingly increased glaucoma can be excluded. Dr. Ruata has carefully studied the relation between ocular tension and blood pressure in normal eyes belonging to normal subjects, in normal eyes of subjects affected by different diseases and in patients suffering from glaucoma. For the variation of blood pressure our author has used the sphygmomanometer of Riva-Rocci which he considers the most delicate of its kind. These are some of the facts which he has observed as a consequence of his investigations:

In normal subjects with normal eyes there is an oscillation during the day of 3-5 mm. Hg. in the intraocular tension, this in general being in the morning higher than in the evening. The blood pressure increases and diminishes with the ocular tension, the amplitude of its oscillations being 5-10 mm. Hg.

In diseased subjects and especially those affected by anemia and malnutrition the ocular and blood pressure are low, the daily oscillations are irregular and their relation, which we have observed in the previous group, is lost.

In glaucomatous eyes the eye tension shows great increase, there is a remarkable difference of tension between one eye and the other even when both eyes are affected, and the daily oscillation which in normal eyes is 3-5 mm. Hg. here reaches sometimes 50 mm. Hg. In all these cases of glaucoma, as a general rule, the blood pressure increases and it is not improbable that this latter fact has a great deal to do in the production of glaucoma, as has been suspected by different observers. It is necessary therefore, whenever we are called to treat a case of glaucoma to accurately examine the arterial tension, and if this is abnormal, to use all the means at our disposal to reduce it to normal conditions. V. L. R.

The Influence of Ehrlich's "606" on Some Ocular Affections.

Manzutto, Giuseppe, Trieste (*Clinica Oculistica,* January and February, 1911). Dr. Manzutto experimented with Ehrlich's "606" in one case of gumma of the lid, in five cases of optic neuritis, in three cases of neuroretinitis, in four cases of iritis and iridocyclitis and five cases of parenchymatous keratitis of syphilitic nature. The results of his observations are as follows:

1. The remedy has never produced injurious effects on the preexisting disease of the eye.
2. The best results were obtained in cases of iritis and iridocyclitis.
3. It seems to exercise no influence in optic neuritis and neuroretinitis.
4. In hereditary parenchymatous keratitis no improvement was observed, while in the acquired form the results were good. V. L. R.

ABSTRACTS FROM INDIAN OPHTHALMIC LITERATURE.

BY

C. M. De, L. M. S.,

AGRA, U. P., INDIA.

Hydatid Cysts of the Orbit.

Elliot, R. H., and Ingram, A. C., Madras, India (*Indian Medical Gazette*, January, 1910), reported three cases of hydatid cyst of such rare origin.

Case I.—A young Hindu male, aged 20 years, was admitted into the Ophthalmic Hospital, Madras, with a marked proptosis on the right side, an opaque cornea with signs of subacute inflammation, and complete loss of vision. The trouble began nine months ago, during which the proptosis gradually increased. The eyeball was removed, and during the operation the cyst, which completely filled the back of the orbit, burst, giving exit to a clear fluid, but was easily separated from surrounding tissues. On examination it was found to be a typical hydatid without hooks, heads or secondary cysts. Examination of the eyeball itself further revealed a cataractous lens with anterior and posterior synechiæ, and an atrophied ciliary body.

Case II.—A Hindu girl, aged 15 years, who gave the history of a swelling of the left upper lid which remained stationary for about 7 months, at the end of which a small tumor appeared at the inner angle of the swollen lid, which gradually increased without giving pain. The tumor was 8 cm. long, 4 cm. broad, and the skin covering was freely movable. It shelled out easily on dissection. On opening it a quantity of creamy pus welled up followed by a cyst 13 mm. long, 10 mm. wide, in which a whitish yellow mass, evidently an invagination, could be seen. Examined microscopically the cyst wall revealed the typically laminated structure of a hydatid cyst.

The rest of the tumor consisted of inflammatory granulation tissue with a thick layer of pus cells on its inner surface, forming the wall of an abscess cavity.

Case III.—A Hindu girl, aged 10 years, was admitted into the Ophthalmic Hospital with a small, red, inflamed, round, ill-defined swelling of the ocular conjunctiva situated on the upper nasal side of the right eye. On incising the conjunctiva a drop of thin grey pus escaped followed by a small thin-walled clear transparent cyst on enlarging the aperture. The cyst was of the size of a split pea and contained a little fluid in which were typical hydatid scolices and hooklets. The surrounding tissues were inflammatory and lined by a pyogenic membrane.

Reaney, M. F., Wardah, India (*Indian Medical Gazette*, June, 1910), reported still another case (IV) of orbital hydatid in an adult male, aged 45 years, who was admitted into hospital with a history of orbital pain lasting eight months, and a protrusion upwards and outwards of the left eyeball, that had come into evidence within the last month. On examination the lower lid was found swollen, pupil dilated and fixed, ocular tension diminished, and ophthalmoscopically a cloudy vitreous. A diagnosis of an orbital tumor being made the eyeball was enucleated. At the time of cutting the optic nerve, a limpid fluid escaped, and on exploring with the finger after enucleation a thin-walled cyst was felt situated at the apex of the orbit from which most of the contents had escaped. Later a portion of the cyst wall examined microscopically showed a laminated structure, and a typical scolex with the rostellum extended. All of these patients denied association with sheep and dogs, on which Cabaut laid so much stress, and in none could the incidence be traced to a trauma.

Calmette's Ophthalmic Reaction.

Fink, L. G., Burma (*Indian Medical Gazette*, June, 1910), reports the case of a Burman Sepoy suffering from phthisis with reference to the decided utility of the ophthalmic reaction in an early diagnosis of pulmonary tuberculosis, when the presence of bacilli in the sputum could not be ascertained. The patient first came under observation with a history of slight cough and loss of flesh. There were, however, no physical signs of phthisis, nor were tubercle bacilli found in the sputum. Calmette's ophthalmic reaction test was applied to the left eye, and a positive result was obtained after 30 hours. Two months later the test was repeated on the right eye, resulting again in a positive reaction. No tubercle bacilli could yet be found in the sputum. It was not till a year later that physical signs indicative of an apical consolidation of the right lung, together with an evening rise of temperature, and increase of pulse respiration ratio manifested themselves, and tubercle bacilli were for the first time found in the sputum.

Subconjunctival Injections of Cyanide of Mercury in Trachoma.

SMITH, HENRY, Amritsar, India (*Indian Medical Gazette*, August, 1910), gives his experience of the subconjunctival injections of cyanide of mercury in the treatment of trachoma, and advocates their unfailing efficacy even in the most obstinate cases. He uses a ten per cent. solution of cocain to anesthetize the eye and injects 20 minims of 1 in 4,000 solution of cyanide beneath the bulbar conjunctiva; and repeats it, if necessary, after a week when the inflammatory edema has subsided. He believes that the cyanide acts on the principal of Bier's treatment, as well as a direct poison to the trachoma organism. He does not, however, give any statistics based on definite results obtained in any number of cases.

Sclerotomy in Glaucoma.

MAYNARD, F. P., Calcutta, India (*Indian Medical Gazette*, July, 1910), in an interesting article gives a brief history of evolution of glaucoma operations, beginning with DeWecker, who first recognized the importance of a filtering cicatrix, and urged the utility of making a scleral incision for the performance of iridectomy. Later, Badar performed a sclerotomy with subconjunctival prolapse of iris; and Treacher Collins proved that iridectomy relieved glaucoma by the formation of a subconjunctival fistula in the sclerocorneal tissue by prolapse of iris. Herbert also noticing that more general success was obtained when the wound healed with large iris prolapses at first imitated the accident, and later elaborated his "wedge-isolation" operation. Following him Lagrange advocated his operation of "Sclerecto-iridectomy" in 1906.

Recently the ideal operation of sclerotomy by trephining has been designed by Elliot of Madras, India, which, however, appears to have been conceived of and performed almost at the same time by Fergus of Glasgow with some difference in details. The operation is performed under the local influence of cocain and adrenalin either dropped into the conjunctival sac or injected subconjunctivally. The patient being directed to look down, a large triangular conjunctival flap with its base lying on the sclerocorneal junction is dissected down to the limbus. The flap is then everted on the cornea, and the spot selected for trephining cleared of all the subconjunctival tissues down to the sclera with the scissor points. Then steadying the globe the trephine—a von Hippel or Bowman—is applied close to the limbus, and with a few quick light movements the sclerotic is cut through. As soon as the anterior chamber is tapped the aqueous wells up alongside the trephine. The conjunctival flap is then replaced in situ and the eye closed. If the iris bulges into the scleral section it is snipped to let out the aqueous. The advantages claimed for this simple operation are a complete and permanent reduction of tension, almost immediate relief of pain, and an arrest of the progressive loss of vision.

Intracapsular Extraction of Cataract.

Kilkelly, P. P., Bombay, India (*Indian Medical Gazette*, May, 1910), gives an analysis of the results of 23 cases of cataract operated upon by Henry Smith of Jullunder fame at the Sir C. J. Ophthalmic Hospital, Bombay. He reports that the capsule ruptured in five, and vitreous prolapsed in two cases during extraction. The complications are detailed as incarceration of iris in five, capsule tags left in the wound in four, vitreous opacities in nine, and iritis in seven cases. The visual results obtained are tabulated as 6/15 in one, 6/20 in two, 6/30 in seven, 6/40 in four, counting fingers from 10 to 18 feet in five, and mere perception of moving bodies in one. He also makes some comments on the technique of reposing the iris forced into the extreme angles of the wound by means of a squint hook; the excessive pressure used in dislodging the lens culminating, in no fewer cases, in rupture of the capsule and vitreous prolapse; the incidence of iritis in a large percentage of cases, and the uselessness of the majority of

Indian statistics merely representing enumerations of extractions by thousands, and statements of extravagant claims for a large percentage of successes. He upholds his contention that "the average patient is exposed to an altogether unnecessary danger" by the intracapsular method of extraction, as is borne out by the high percentage of bad results that followed in cases operated upon by Henry Smith himself, and carefully investigated along with two experienced American ophthalmic surgeons—Drs. Bentley and Pontius of Seattle, Washington, who at the time happened to be in Bombay.

SOCIETY PROCEEDINGS.

BY

T. B. HOLLOWAY, M. D.,

PHILADELPHIA.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Meeting January 19, 1911. Dr. William Zentmayer, Chairman, presiding.

Unilateral Vertical Nystagmus.

Dr. Zentmayer presented a patient with *Unilateral Vertical Nystagmus.* J. F., aged seventeen years. The eye has been turned since five years of age. As long as he can remember, objects looked at "jumped." He never had diplopia. Has worn glasses five years. Has one brother and one sister, but neither has any eye trouble.

There is an esotropia of 40 degrees, measured on the perimeter. The right eye is the fixing eye. In the left eye there is a vertical nystagmus. The movements are short and rapid; are not constant, and are less pronounced on fixation. The irides react promptly to light and convergence. The pupils are equal. No ophthalmoscopic changes. A double advancement after the method of Worth was done at the same time on the external recti, one by Dr. Zentmayer, the other by Dr. Weinburger, the senior resident at Wills Hospital, where the case was seen. Ten days later, as there was a residual squint of 8° (perimetric), a tenotomy of the internal rectus of the left eye was done. For some time there was a most annoying diplopia. The images could not be made to fuse by any combination of prisms. About one month later the diplopia was no longer annoying, and is now little regarded. There is at present a R. H. of 9° (prismatic).

There is orthophoria for the lateral muscles. With a 9° prism, base up, before the left eye, single vision is maintained. Refraction: R. E. + 4.50 ○ + 1.00 c. ax. 180° = 6/5. L. E. + 3.50 ○ + 1.75 c. ax. 15° = 6/20. With the amblyoscope there is, with the correcting prism, third dimension vision.

Dr. Zentmayer stated that in 54 reported cases the nystagmus was vertical in 36, and that in more than one-half of the cases it has been associated with squint. In only 1 case, that reported by v. Graefe, was the nystagmus in the fixing eye.

Duane divides the cases into two groups—those occurring in infants and those in later life. In the first group it is met with in spasmus nutans, and with unilateral opacities in the media. In the second group, in unilateral amblyopia and squint, unilateral astigmatism of high degree, and in diseases of the nervous system. He considers that these cases do not differ materially in causation from the bilateral type. The primary cause is probably the same—perverted action of the centres governing coordination.

Verhoeff's explanation of a case with squint is that "at first there is a cortical lesion, probably congenital in origin, that tends to produce nystagmus in both eyes. This is associated with, although independent of, an absence of the function of binocular single vision, which leads to the development of squint. Owing to one eye being now used for fixation, its tendency toward nystagmus is now fully compensated for. On the other hand, the squinting eye never being used for fixation, its tendency toward nystagmus is allowed to become manifest."

Umbrella Perimeter.

Drs. Reber and McCool (by invitation) presented an umbrella perimeter, which they had found equally serviceable for everyday use in the consulting-room, and also as a portable instrument. In its mechanism it is really a modification of the umbrella in every-day use. The ordinary handle is omitted and a cover used on the inside as well as the outside. Consequently, when the umbrella is expanded or put up, a black hemispherical surface is presented, which, very naturally, offers many advantages over the ordinary blackboard.

It is most useful in the study of scotomas, and is quite as serviceable in the accurate determination of the periphery of the visual field.

For it the authors claim ease of application, a background without any disturbing influences, rapidity in making examinations, no constrained position for the patient, portability and small cost for the apparatus.

As disadvantages in the present instrument, they admit that it is not an absolutely perfect sphere, that with it there would be a 5 to 10 degree limitation in the lower temporal field, also that the patient's head is not perfectly stationary. For this same reason, however, the examination is not so fatiguing.

They simply wished to present the idea, recognizing that there is much room for mechanical improvement in the construction of the instrument. They have used the device constantly for the last six months and have found it abundantly satisfactory.

Dr. Crampton, in complimenting Drs. Reber and McCool on their ingenious perimeter, and noting the difficulty in centring the eye before an instrument of this kind having no chin-rest, suggested a small round mirror for a fixation point. The patient should be told to look at his own eye in the mirror, and unless the eye were exactly in a central position it could not be seen. The mirror might be surrounded by a narrow white ring to attract attention.

Dr. William M. Sweet spoke of the difficulty of securing accurate color fields by the use of colored disks of paper or cardboard, as employed in the ordinary daylight perimeter, and believed that ultimately a satisfactory material would be obtained to give a true color value with the transmitted light of the incandescent lamp. Colored glass and colored fluid in glass cells had been tried by him with indifferent success, but he hoped soon to secure gelatine films, especially colored for use with the electric light perimeter, each color being accurately determined by spectroscopic study.

Molluscum Contagiosum of the Eyelids: A Supplementary Report.

Dr. Sidney L. Olsho made a supplementary report on the case described at the October meeting as "A Case of Symmetrical Tumors of the Eyelids allied to Dermoids." At a subsequent visit of the patient, several tumors resembling those previously noticed only on the lids were seen on other parts of the face, there being several in the neighborhood of the chin and mouth. The photographs, drawings, and histological sections were submitted to Dr. M. B. Hartzell, of the University of Pennsylvania, to whom Dr. Olsho was indebted for the positive diagnosis of molluscum contagiosum. In the histology given in October the growths were described as consisting of a number of small lobule-like structures separated by connective tissue. The centre of each lobule was said to be occupied by large, poorly staining granular cells having each a more or less spindle-shaped nucleus, generally placed to one side. These cells were not identified. They are now known to be the molluscum cells characteristic of the disease, the cell itself being occupied by the so-called molluscum bodies, the contagious element. The exact nature of the latter is yet unknown. According to recent views, their presence causes a proliferation of the rete layer of cells of the epidermis. This gives rise to the tumor-like formations, separated by the connective tissue of the papillæ of the corium. A progressive degeneration of these proliferating cells, resembling the process of keratinization, is said to take place. The molluscum growths have no analogues in pathology. The presence of the molluscum bodies is pathognomonic of the disease.

Dr. Shumway asked if there was an absence of umbilication in the growths, as this was usually an important point in the differential diagnosis of the condition. He had seen a large number of cases in one of the orphan asylums of the city, which were subsequently reported by Dr. Frank Knowles, and the contagiousness of the disease was very evident. He believed that in the treatment of the growths it was best to curette them first, and then use some cauterizing agent, such as trichloracetic or carbolic acid.

Dr. S. D. Risley had seen a number of cases of molluscum contagiosum, in all of which he had curetted away all of the affected tissue, and, where the area was small, cauterized the denuded surface with trichloracetic acid; but in one instance, where the denuded surface was 12 mm. in diameter, he had covered the denuded area with Thiersch graft. In their well-developed stage, he thought their appearance was quite characteristic and diagnosis not difficult.

Dr. Zentmayer said that in his experience the disease was one rarely seen in eye clinics. This is due to the fact that it is essentially a skin affection and the ophthalmologist sees only those that are accompanied by some affection of the eyes.

Toxic Paralysis of Accommodation.

Dr. Howard F. Hansell read a paper on the "Toxic Paralysis of Accommodation," and stated that the dilation of the pupil, so often associated with amblyopia from toxemia, cannot be classified as toxic paralysis of the pupil, since it is not dependent upon an affection of the peripheral or central nerves, but upon the degree of amblyopia. Ciliary paralysis also does not occur. The accommodation cannot be determined, because of the low acuity of vision, without the use of a special instrument.

Disturbances of the extraocular muscles are not common, although authentic reports have been published. External ophthalmoplegia and nystagmus are rare. Isolated ophthalmoplegia interna, according to Uhthoff, never occurs.

In the first case, two possible causes only could be discovered, namely, epilepsy and alcohol poisoning, with the probabilities stronger in favor of the latter. A strong, healthy man noticed sudden loss of the power of reading; the pupils were widely but not fully dilated, and responded to light. He recovered fully in five days the lost accommodation and the normal size and reaction of the pupils. The second case closely resembled in its symptoms the first. The paralysis of both the ciliary muscle and the iris was more complete; several examinations of the urethral discharge revealed gonococci in moderate abundance. Recovery ensued in about one month without ocular treatment.

Dr. Risley said that he had been much interested in the group of patients presented by Dr. Hansell. That while he had nothing new to offer, he suggested that it would be interesting, and possibly important, to watch subsequent developments in order to determine whether or not the transient paralysis of accommodation might not be a manifestation of the early stages of tabes.

Dr. Ziegler thought it was possible that the class of peripheral palsies described by Dr. Hansell could be caused by an excess of toxins in the system, and that these toxic chemicals might have a direct corrosive action on the peripheral nerve fibres similar to that of wood alcohol on the neuroretinal structures. This is exemplified in the relief of impending diphtheritic palsies through dilution of the perverted secretions by hypodermoclysis. Last summer Dr. Ziegler saw a case of acute poisoning in a two-year-old child, with pronounced myosis, spasm of the interni, and coma which was followed by severe vomiting. In differentiating between opium, nicotine and muscarine poisoning, opium was excluded because it was not accessible. The child could easily have picked up and eaten a cigarette stump or a poisonous toadstool that might have been found in the yard. It has been shown that acute nicotine poisoning will produce myosis. Knies asserts that the muscarine found in toadstools and fish may cause myosis and accommodative spasm, while the tyrotoxine of fish will cause mydriasis and paralysis of accommodation. This direct corrosive action of toxic chemicals on the delicate structure of the eye is a subject that deserves our closest study.

Pulsating Retinal Vessel Extending Forward Through Vitreous as a Twisted Loop.

Dr. Crampton exhibited a young man, Fred S., aged twenty-four years, who, quite unaware that there was anything the matter with his right eye, presented himself complaining of poor vision in the left (6/60), which proved to be due to a high error of refraction.

The right eye, which had a negligible refractive error and a vision of 6/6, proved to be the more interesting. On ophthalmoscopic examination with a high power lens, a slightly pulsating loop of vessels was seen close to the posterior surface of the lens, and could be easily traced to its origin in the center of the optic disk, where it appeared to spring from the lower nasal vein in a close spiral.

The fundus was otherwise normal, and the vitreous quite clear. The long twisted loop was free from superfluous connective tissue and seemed patulous throughout.

Meeting February 16, 1911. Dr. William M. Sweet, Chairman, presiding.

Pneumococcic Conjunctivitis.

Dr. Leonard D. Frescoln exhibited two cases of "Pneumococcic Conjunctivitis" from the service of Dr. Howard F. Hansell at the Philadelphia Hospital.

Case I.—Female, aged two years. Following an attack of measles in December, 1910, a bronchitis, staphylococcic ear discharge, and a vaginitis developed. The last of these conditions was negative for the gonococcus. In about a month a virulent conjunctivitis developed in the right eye, associated with a ropy secretion that would cling to the lashes. An examination of the secretion determined the presence of the pneumococcus. The child was transferred to the eye ward, and subsequently an ulcer developed on the lower portion of the cornea. At the present time the eye is making a good recovery. There were several cases of pneumonia in the same ward with the patient while she was in the isolation building.

Case II.—The condition in this case was similar to the above, except that the patient was admitted directly from the street. There was no history of measles and no ulcer formation. In this case the right eye was also affected, but is now making a rapid recovery. Dr. Frescoln stated that these were two of eight cases that had come under his observation at the hospital during the past year.

Dr. Howard F. Hansell stated that the characteristic signs of pneumococcus conjunctivitis as described by Saemisch in the second edition of Saemisch and Graefe were typically shown in the two children presented by Dr. Frescoln. The diagnosis, made certain by the bacteriological examination, could be made with a remarkable probability of accuracy from the clinical appearances alone. Both cases were monocular; the severity of the inflammation was borne by the lids and the palpebral conjunctiva while the ocular conjunctiva was far less edematous than in the Koch-Weeks or the gonococcus affection; the discharge was profuse, thin, and contained many threads and small patches of membrane, and was not thick, tenacious, and homogeneous. The conjunctiva of both lids, principally the superior, was partly covered by fragmentary membranes easily detached; and the corneæ were free from involvement in one case and one cornea slightly infiltrated in a minute area in the other case. In one respect, however, these cases vary from the classical description of Saemisch, namely, the absence of small hemorrhages in the conjunctiva. Although the children were inspected daily and carefully tended, this sign has not been noted.

Intra-Ocular Growth.

Dr. Shannon exhibited a case of chorioidal tumor in a young girl, aged sixteen years. She presented at her first office visit last November the symptoms of serous iritis with marked deposits on Descemet's membrane. Vision was reduced to light perception. She responded to iodides and local treatment very quickly, and with the clearing of the media about four weeks later a swollen area with almost brilliant white reflex and with overlying edematous retina was seen between the macula and disk occupying most of this area, with the edematous retina encroaching on the disk. Although she has been under treatment with mercurial inunctions for six weeks, no appreciable change has taken place in the appearance of the tumor.

In reply to Dr. Holloway, Dr. Shannon stated that a tuberculin test had not as yet been made.

Intra-Ocular Growth, Probably a Melanoma.

Dr. Holloway exhibited a male, aged forty-eight years, who in the summer of 1906 accidentally discovered that he could not see with the left eye. He visited one of the city hospitals, where it was discovered that he had a bilateral chronic glaucoma, and in September, 1906, an iridectomy was performed on the left eye. On May 19, 1910, this patient was referred, by his physician, to the University Hospital on account of a suspected tumor of the ciliary body. At that time the vision of O.D. was 6/12, while O.S. was blind. Since that time the character of the lesion has shown practically no change except that upon one visit to the hospital no signs of the tumor could be found, but upon a subsequent visit, several months later, it was readily noted. At the present time the vision of O.D. is 6/15. In the right eye the nasal field is obliterated, with a contraction of the temporal field to about 50°, and marked restriction above and below. In the right eye the cornea is clear; the temporal half of the anterior chamber is shallowed by a pushing forward of the outer half of the iris, and projecting about 1 mm. beyond the pupillary margin and inserted between the iris and the lens can be noted the smooth, rounded, brownish margin of the growth. Dr. Holloway stated that the diagnosis was somewhat in doubt, the growth probably being a melanoma or possibly a slowly growing sarcoma. He stated that the failure to find evidences of this growth about six months ago was most interesting, and that he could not imagine that the condition was a cyst that had spontaneously evacuated itself and subsequently refilled. The fundus in each eye presents the characteristics of a chronic glaucoma, the disks being completely cupped.

Dr. Hansell inquired concerning the proposed treatment.

Dr. S. D. Risley expressed his interest in these pigmented masses on the posterior surface of the iris and at the pupillary rim. He had frequently seen large masses of this kind at the pupillary rim often invading a considerable area of the pupil in horses' eyes, but had never seen them assume any apparent pathological significance. He recalled the case of a young woman, aged about seventeen years, who had been kept under observation for several years, who had a large pigmented mass apparently larger than in Dr. Holloway's case, situated at the nasal side instead of the temporal. While under observation nothing occurred to suggest malignancy, and she finally passed from under observation. The temporary disappearance of the growth in Dr. Holloway's patient interested him greatly. By way of explanation of its disappearing from view, he suggested the possibility that the growth was pedunculated instead of sessile. In that case it might slip back into the posterior chamber and again be forced forward and assume the disk-like shape while under pressure between the posterior surface of the iris and the capsule. This possibility also suggested the possibility of its being a cyst, the contents of which may vary under varying conditions.

In reply to Dr. Hansell, Dr. Holloway stated that the case was reported from the service of Dr. G. E. de Schweinitz at the University Hospital, so that he did not have the direct management of the case, but it was necessary to remember that the patient was a one-eyed man, and that if the growth affected his own eye he would continue the treatment of the chronic glaucoma and not resort to operative interference until there was more positive evidence of the malignancy of the growth, at which time he would resort to a radical operation.

Trachoma Bodies.

Dr. Zentmayer and (by invitation) Dr. Wm. T. Reese exhibited smears showing the v. Prowazek bodies. Dr. Zentmayer stated that several of the slides had been presented to him by Dr. Harlan Shoemaker, who had obtained them from fresh untreated cases in immigrants arriving at the Philadelphia Station. Others were obtained by Dr. Zentmayer from recent untreated cases occurring in a reformatory school. Dr. Zentmayer sketched the history of the finding of these bodies and the later development in the investigation of them, and spoke of the recent monograph on the subject by Herzog, which has lately been reviewed in the *Ophthalmoscope*. Herzog, through the opinion of several of the leading protozoölogists of Munich to the effect that these cell inclusions were colonies of bacteria, was led to investigate into the possibility of a metamorphosis of gonococci into cell inclusion granules. Staining gonococcal pus with Giemsa, he found more gonococci than by the usual method of staining, and also that there was a tendency for them to collect near the nucleus of the leukocyte and that they were agglutinated by a thread of plastin, giving rise to an appearance similar to the nuclear cap seen in trachoma. He believes this collection to be a transitional form. Further, in studying the changes which occur in gonococci which were undergoing degeneration, he found that the kidney shape was soon lost and a form appeared which was one-half the size of the normal gonococcus, which he considers a further transitional form. The final forms are the microgonococci, and these he considers identical with the trachoma bodies. All of these forms were seen in a case of gonorrheal ophthalmia. At first only typical gonococci were met with, but after treatment these disappeared and trachoma bodies were found.

Dr. Reese, in referring to the trachoma bodies, described them as circular, oval, or crescentic bodies made up of a large number of minute compact granules without a nucleus, which are almost always found in the epithelial cells near the nucleus, sometimes capping it. The bodies vary in size and shape, some being much smaller than a red blood cell, others are larger than a white blood cell. Sometimes they are irregular in outline, with their granules strewn for some distance in the cell protoplasm. With the blood stains, most of the granules stain a deep purple and are compact, while the large bodies and those with the loose granules stain a pinkish violet, showing a peculiar hyaline appearance. Dr. Reese further described the technique for the preparation of the smears, and stated that he preferred Leishman's stain. Dr. Reese thought that these bodies were suspicious and probably a step in the right direction, but he felt that much more irrefragable proof was needed concerning their origin, development, and their closer connection with trachoma. He also believed that further work must be done to prove them protozoa and to overthrow the gonorrheal and other associations of the disease.

Tuberculous Keratitis.

Dr. Krauss presented a case of "Tuberculous Keratitis" occurring in a girl, aged ten years. The cornea was everywhere faintly hazed, translucent, with much new vessel formation, running from the periphery to two dense cheesy-yellow roundish areas of infiltration on each side of the centre of the cornea.

These areas had been much larger, almost coalescing previous to treatment with increasing doses of tuberculin emulsion. The maximum dose given was 1/500 mg. There were no general disturbances, though the ocular reaction was strongly pronounced after each injection.

The von Pirquet test was strongly positive. About one year previously the patient had a somewhat similar condition, which had not only failed to improve upon the use of tuberculin injections, but was made worse by each administration. Several months afterward the ocular condition cleared suddenly, though no change had been made in the treatment, which had consisted of forced feeding, tonics, atropine, dionin, boric acid solutions, yellow oxide of mercury ointment, subconjunctival injections, etc., at various times.

In her recent attack the tuberculin treatment has shown very excellent results, the patient's general health being much better and her ocular condition alleviated.

Dr. Krauss also stated that in quite a number of cases of tuberculous keratitis in children he had had unfavorable ocular reactions after each use of the tuberculin, though a general reaction was generally absent. These cases, however, healed up rather quickly about six to eight weeks after the cessation of the use of tuberculin.

Dr. S. D. Risley asked Dr. Krauss whether there had been any reaction following the von Pirquet test, the reply being negative, but that the eye grew persistently worse under its administration, so that it was found necessary to abandon tuberculin; and local conditions improving under other methods of treatment he thought might suggest a doubt as to the tuberculous character of the local infection. He had had but little experience in the use of the von Pirquet test in ocular affections, but in a considerable group of patients with tuberculous affections of the eye he had employed the hypodermic injection of old tuberculin, manufactured by Mulford, and had invariably secured not only local, but well-marked general reaction, which lasted from one to three days and had then been followed by a rapid improvement in local conditions and general improvement of health. With each succeeding injection both the local and the general reaction grew progressively less pronounced, until in some instances the third, and in others the fourth, injection produced no result. He had in no case found anything but encouragement in the use of this procedure, but had been careful before its employment to exclude the presence of extensive pulmonary deposits or any evidence of general miliary tuberculosis.

Dr. Langdon asked whether the general improvement might account for the improvement of the local condition.

Dr. Krauss, in closing, stated that the diagnosis had rested upon the peculiar ocular condition which he regarded as typical, especially when associated with the strongly positive character of the von Pirquet reaction, the local reaction in the affected eye after each injection of tuberculin, the so-called scrofulous appearance of the child with large tonsils, adenoids, and enlarged lymph glands. In answer to Dr. Langdon he replied that the patient had improved greatly in general health previous to or coincident with the ocular improvement. He considered the promotion of the general health as very essential in the cure of the disease.

Sarcoma of Left Upper Eyelid.

Dr. G. E. de Schweinitz and Dr. E. A. Shumway reported a case of "Sarcoma of the Left Upper Eyelid," in a negress, aged eighty-one years. The tumor measured 1½ inches long and 1¼ inches broad, and hung down over the cheek. The preauricular and submaxillary glands were involved by metastasis. Under local anesthesia the mass was dissected from its position between the tarsal cartilage and skin. There was subsequent decrease in the size of the enlarged glands. A microscopic examination, made by Dr. Gordon J. Saxon, showed that the tumor was a round-celled sarcoma, free from pigment. Approximately, 80 cases of sarcoma of the eyelids are on record, about 43 per cent. of which have been round-celled, 40 per cent. spindle-celled, and the rest mixed. About 35 per cent. have been pigmented. Attention was called to the advanced age of the patient. Operation had been advised because of the great annoyance caused by the presence of the heavy mass in the lid.

Report of a Case of Syphilitic Iritis Successfully Treated by Salvarsan.

Dr. Edward A. Shumway detailed the history of a case of "Iritis," in a man, aged thirty-five years, occurring nine months after the primary lesion. Under mercurial treatment the attack subsided in four weeks, but subsequently recurred in a more severe form. Despite vigorous treatment with mercury and aspirin, the attack failed to yield, and the Wassermann test remained positive. A subcutaneous injection of salvarsan, administered by Dr. Henry Cattell, caused a disappearance of the inflammation within three days, and the eye had remained quiet for a period of ten weeks. Reference was made to the reports of recurrences of symptoms, after injections of salvarsan, which were appearing in the literature, and the fact that certain cases of syphilis seemed to be refractory to it. Dr. Shumway thought that while the drug had failed to realize Ehrlich's hope that one dose would permanently cure syphilis in man, nevertheless it was to be welcomed as an exceedingly valuable remedy, especially in those cases which did not respond to mercurial treatment.

Dr. Howard F. Hansell said that his views on the relative values of salvarsan and the mercury and iodide treatment of syphilis were not clearly formulated. To deny the merits of the former because it is new, and to extol the advantages of the latter because it has proved its worth, would be puerile. He had had lately under treatment a man with well-marked gummatous iritis, who within seven days after an intravenous injection of salvarsan had completely recovered. Synechiæ were broken off and exudation absorbed without the use of atropine. Several other cases of specific iritis were treated in the eye ward of the Jefferson Hospital with equally good, though not as brilliant, results from a single injection. On the other hand, recoveries under mercurial inunctions, daily sweat baths, postassium iodide, atropine, and hot compresses have been so prompt and complete that one hesitates to abandon so efficient a treatment.

The suggestion by Dr. Shumway of the German method is admirable—the intravenous injection of salvarsan followed by a course of mercury and iodide, which means practically that no means should be neglected, old or new, which contribute to a speedy and permanent sure.

Dr. Wm. M. Sweet referred to two cases of iritis treated at the Jefferson Hospital three months ago, in which there was a rapid subsidence of the inflammation on the third day after the injection, which was made subcutaneously. No return of the symptoms had been noticed since the treatment. In recent instances salvarsan has been given intravenously, and this was now the plan followed in all cases.

Dr. Ziegler stated that he had under his care a case of interstitial keratitis that had received two injections of arsenobenzol; one was intragluteal, with moderate improvement, the other was intravenous, and proved to be most efficient in clearing up the corneal infiltrate and in influencing the Wassermann reaction.

Dr. Shumway, in closing, referred to the case of which Dr. Hansell had spoken, and said that Dr. de Schweinitz had seen the patient and felt that the optic neuritis was probably due to the presence of a gumma in the brain, and not to the action of the salvarsan. He mentioned also another patient under the care of Dr. de Schweinitz, at the University Hospital, whose pupil began to dilate after the use of "606," although it had resisted the action of the atropine, while mercury alone was used. He agreed with Dr. Hansell that the drug should be employed in iritis when possible, preferably by the intravenous method, but thought that treatment with mercury and iodides should not be neglected.

Meeting March 16, 1911. Dr. William M. Sweet, Chairman, presiding.

Buphthalmos.

Dr. Leonard D. Frescoln exhibited a case of *Buphthalmos* occurring in an Italian immigrant, aged seventeen years, who was admitted to the Philadelphia General Hospital on March 7. The vision of the right eye was 1/100. The cornea measured about 15 mm. in diameter and was clear. The anterior chamber was deep. The pupil was slightly irregular and was sluggish in its reactions. Above, in the upper portion of the pupil, could be noted a few posterior synechiæ. The nerve head showed a marked cupping and the eye was myopic to the extent of 7.00 D. T.+. In the left eye the vision was 20/30 and in other respects similar to its fellow.

Dr. Holloway stated that there were some half dozen cases of buphthalmos in the Pennsylvania Institution for the Instruction of the Blind, and most of the eyes showed some corneal opacity. Recently one of these children, as a result of trauma, developed a hyphema that almost completely filled the anterior chamber; this was absorbed without subsequent pigmentation of the cornea.

Dr. Langdon thought that one of the most interesting features in the case exhibited by Dr. Frescoln was the unusual depth of the anterior chamber, which seemed to be out of proportion to the general enlargement of the globe.

Hess Operation for Bilateral Congenital Ptosis.

Dr. Holloway exhibited a patient, aged thirty-five years, on whom a *Bilateral Hess Operation* had recently been performed for congenital bilateral ptosis. The greatest width of the palpebral fissure of each eye had been 4 mm., and during the past few years the patient had frequently been compelled to stop work owing to the extent of the ptosis. The skin of the forehead was markedly corrugated and there was some upward rotation of the eyes, but this was difficult and was poorly maintained. The other ocular rotations were full. The result of the operation was excellent and at the present time the palpebral fissures can be said to be of normal width and practically equal. Furthermore, the patient can close the lids. While the technique of this operation may be regarded as simple, the dissecting of the skin flap requires more care and is more tedious than one is led to believe by some of the descriptions found in the various works of ophthalmic surgery. Dr. Holloway believed that the dissection should be carried well toward the margin of the lid and care should be taken that the loose areolar tissue does not deceive one as to the actual depth of the pocket. Immediately following the operation a Ring mask with transparent celluloid bound down by adhesive plaster, was used as a protection to the eye.

Dr. Zentmayer said that some years ago he had performed the Hess operation on one eye, and the Tansley-Hunt operation on the other eye, of the same patient. Judged by a photograph of the patient taken about two years subsequently, the Hess operation had given the better result, as the normal elliptical aperture of the palpebral fissure had been retained, whereas in the other eye the fissure was relatively too wide at the point corresponding to the position of the skin tongue which is slipped up under the brow. In another case in which the Tansley-Hunt operation had been performed, there had been a disfiguring thickening of the wound margin in the skin of the lid.

Tubercle of the Iris.

Dr. Charles R. Heed exhibited a male, aged forty-five years, colored, who, at the age of seven years, was attacked with scrofula, affecting the glands of the face and neck and which continued for a period of seven years. In October, 1910, he contracted syphilis. When first seen he stated that the condition had been present for two weeks. The right eye was healthy and the visual acuity was 6/6. The visual acuity of the left eye was 6/21. The conjunctiva was congested; the pupils small and fixed. In the superior nasal quadrant of the iris could be noted a small nodule situated midway between the ciliary and pupillary borders. Two weeks later, despite the fact that the patient had been on mercurial treatment, the nodule was much larger, lighter in color and apparently caseating. Ten days later a light gray deposit filled about one-quarter of the anterior chamber. Dr. Heed felt that the following points would favor the diagnosis of tubercule: The history of scrofula; positive von Pirquet; situation of the nodule and its rapid growth during the administration of mercury; its pale color and apparent caseation.

Dr. Sweet stated that he had examined the man upon his admission to the hospital, and, with the history of specific infection, regarded the growth as a gumma of the iris. The increase in size under full doses of mercury by inunctions, and the alteration in the appearance of the mass, pointed to tubercle of the iris as the more probable diagnosis.

Dr. Zentmayer said that as in this case both infections, tuberculosis and syphilis, were known to be present, the diagnosis would have to rest on the clinical conditions, and based upon this he favored syphilis as the probable cause. Tuberculosis of the iris was usually seen in young individuals and he thought usually in association with a cyclitic nodule and sometimes with the characteristic deposits in the substantia propria of the cornea. He did not think much weight should be attached to the fact that there was an hypopyon, as this occurs also in the large yellowish-red papules of syphilitic iritis.

Dr. Randall said that failure of the lesion to respond to antisyphilitic treatment hardly proved its nonluetic nature. The worst case of gumma of the iris which he had seen, and perhaps previously quoted, showed multiple lesions of each eye. They grew worse under mercury pushed to salivation and under iodide pressed until the patient, with marked acne and stuffed nose, begged off from its further use. He was then lost sight of for nearly a month, confined by a pneumonia and having no specific medication; and was greatly worse when seen again; the lesions, like multiple sarcomata, threatening to come through the infiltrated cornea. Under 5-drop doses of Donovan's solution, which was perfectly borne, the growths melted away with marvelous rapidity, a week making huge improvement and a fortnight more bringing complete cure.

Dr. Crampton in referring to the hypopyon in Dr. Heed's case, spoke of the interesting results he had experienced in a few cases of keratitis with hypopyon. Having in mind W. M. Barton's successful recovery of formaldehyde from pus obtained from a case of disease of the middle ear when hexamethylenamin had previously been administered internally and also the experimental work of Crowe, of Baltimore, who recovered the drug from the spinal canal under similar conditions, Dr. Crampton determined to try the same test on the aqueous humor. Pending the finding of a suitable case for this he administered the drug empirically in cases of keratitis with hypopyon with what appeared to be most satisfactory results. The number of cases, however, were too few for the formation of a definite idea as to the usefulness of the drug.

In a case of rheumatic iritis in which hypopyon suddenly appeared, the latter cleared up in twenty-four hours, during which time four 5-grain doses of formin had been administered only to be followed the next day by a hyphema which disappeared over night on discontinuing the formin.

In a case of hypopyon associated with traumatic ulcerative keratitis the deposit was cleared up after the ingestion of three 5-grain doses of hexamethylenamin. Atropine, of course, being used locally.

Dr. de Schweinitz inquired of Dr. Crampton whether he had tried urotropin in iritis, iridocyclitis or uveitis, in the absence of hypopyon, and spoke of a patient with a traumatic iridocyclitis in whom the remedy had seemed to be of much service.

He also discussed its recent use in sympathetic ophthalmia and its value in general surgery when it was administered to patients with head injuries or other cranial conditions liable to originate meningitis prior to and after operative interference, and to a similar use of the remedy in joint surgery.

Some Anomalies of the Retinal Circulation.

Dr. G. E. de Schweinitz exhibited a water color of the right fundus oculi of a man, aged thirty years, who had consulted him in the convalescence-stage of a mild iritis of the right eye. The patient was married, had three healthy children, was subject to rheumatism, and had contracted gonorrhea at the age of twenty. In other respects his condition was good, and there were no anomalies of the cardiovascular apparatus. Both eye-grounds exhibited the most astonishing tortuosity of the retinal vessels, both arteries and veins being affected to a degree that Dr. de Schweinitz had not previously observed. The veins, especially of the left eye, were larger than normal, the arteries of about normal size. The tortuosity affected all ramifications of the retinal vessel system. Vision, after the correction of 2.50 D. of H., was entirely normal. Dr. de Schweinitz referred to other reported cases of this character, notably the ones described by Nettleship.

Dr. de Schweinitz also exhibited a water color of the right fundus oculi of a Russian woman, aged twenty-seven years, the refraction being myopic (— 8 s $\overset{\frown}{\smile}$ — 0.75 c. axis 60, V. = 4/6), in which the inferior temporal vein, instead of penetrating the disk in the usual position, was placed close to the lower and outer margin of the disk. Here the vessel made a sharp forward bend and bridged a moderate area of chorioidal disturbance; its remaining length pursued about the usual course, and the vessel was about of normal size. Its point of entrance into the disk was surrounded by a circle of dense black pigment, in diameter about half the width of the vein. Dr. de Schweinitz in his previous examinations of aberrant or anomalous vessels, had not noted this circle of pigment at the point of emergence or entrance, although he had often seen patches of pigment on the disk surface.

Dr. de Schweinitz also made some reference to unusually active pulsation of retinal veins in asthenopic eyes, and noted that in some cases in which the ocular discomfort was limited to one eye, this eye alone exhibited the venous pulsation, or else exhibited it in a much more marked degree than its fellow.

He also made some remarks on what he termed "abnormal smallness of the retinal vessel system," which he thought he had noted in some patients with pronounced and long-continued, so-called neurasthenia, vision, light-sense, and field of vision (unless it was a retinal tire field) being normal. He referred to the statements of some neurologists that patients who were the subjects of such a neurosis had not infrequently what had been termed a "smallness of the general vascular system," and therefore an inadequate blood supply, and he thought, if these observations were correct, and he fully realized how many would have to be made to determine their accuracy, they furnished an interesting subject for future study.

Dr. S. D. Risley said he was much interested in the cases presented by Dr. de Schweinitz. He did not recall any cases in his experience occurring in healthy eyes and without general vascular derangement, presenting such striking engorgement of the retinal circulation as shown in the illustration presented by Dr. de Schweinitz. He had, however, seen many instances of marked venous pulsation at the poros opticus in asthenopic eyes. One of these cases, a medical student, now an eminent practitioner, he had had under observation for several years, but the pulsation and asthenopia persisted. Dr. Risley had never been able to formulate any satisfactory explanation for the pulsation. He had often seen aberrant retinal vessels emerging from the surface of the papilla, but had never seen one with a ring of pigment around it as shown in the illustration. The abnormally small retinal vessels and the suggested possible relation to neurasthenia was very interesting. He could conceive it possible that the retinal circulation might be but part of the general "smallness of the circulation" system, and that this might furnish an anatomic basis for a lifelong neurasthenia. He suggested as a possible analogy of such an anatomic variation the well-known variation in the length of the intestinal tract. As the individual with only twenty-eight or thirty feet of intestines might be unable to appropriate sufficient food for the requirements of the tissues and so be a weakling all his life, so the man with forty feet or more, would die from gout because of his ability to digest excessive quantities of food. So the individual with "smallness of circulation" might suffer through life as a neurasthenic because of the inability of the arteries to carry sufficient nourishment to supply the requirements of the tissues.

Dr. Zentmayer referred to a case of monocular congenital tortuosity of the veins seen in a young man. He considered that these cases were in particular apt to give the impression of being due to some acquired condition. On seeing this patient after a lapse of three years this was his thought until reference to the case history showed that the condition had been noted at the time of the first visit.

Dr. Zentmayer referred to a case of bilateral tortuosity of the vessels seen first about fifteen years ago. He had had the patient call at his office this morning to confirm his first view of the case and found that there had been no change. The vessels were almost as tortuous as in Dr. de Schweinitz's case. Those distributed to the nasal fundus showed the peculiarity in a most marked degree.

Dr. Langdon stated that he had seen a case in which the whole retinal circulation was unusually small, the patient being neurasthenic and under the care of Dr. Wier Mitchell for some acute mental condition.

Dr. Randall said he had not seen such pigmented exit of a vessel from the disk. He recalled having sketched, thirty years ago, for Dr. Risley, much such a case of very tortuous retinal vessels in a boy, presenting only a considerable hypermetropia, much like the eye-grounds exhibited by Stephen Mackenzie in the Ophthalmological Society of the United Kingdom (*Transactions*, 1884, iv, 152). He had not found his original drawings of this and other cases; but showed an extreme instance of looping of some of the retinal vessels in one of his patients (Fig. 136, *American Text-book of Eye, Ear, Nose and Throat*).

Tuberculous Cyclitis and Chorioiditis.

Dr. S. Lewis Ziegler presented a case of tuberculous cyclitis and chorioiditis resulting in complicated cataract. The patient, a female, aged twenty-seven years, had passed through many recurrent attacks of uveitis and hyalitis before the tuberculous nature of the lesion was suspected. A diagnostic dose of Koch's old tuberculin was followed by a marked local and systemic reaction. A typical tubercle of the ciliary body could be distinctly seen in the upper nasal quadrant. The eyes became quiet after 20 injections, but the ciliary disturbance ultimately resulted in cataract. The opaque lens in the right eye was subsequently removed and a typical V-shaped iridotomy was recently performed. Vision with the correcting lens is 20/200 and J. 6. No evidence of the ciliary lesion can now be seen, but a pronounced crater-like excavation on the temporal side of the fundus marks the site of a former tubercle of the chorioid. The vitreous debris seems to have been absorbed. The left eye is now quiet and will be operated upon later.

Dr. Ziegler also presented a youth with tuberculous cyclitis, complicated by interstitial keratitis, which closely resembled a luetic lesion. Although there was considerable evidence pointing to hereditary syphilis and the family history revealed similar lesions among his relatives, a continuous course of mercurial inunctions given in another city, for about nine months, did not yield much improvement. The Wassermann reaction was faintly positive. Donovan's solution was given hypodermically for several weeks with no result. The differential diagnosis was chiefly based upon the negative influence of mercurials after nearly a year's trial, and the positive reaction to test injections of Koch's old tuberculin. These injections were continued once a week, until 10 were given, the last dose reaching 5 minims, and not being followed by any reaction. The night sweats were controlled by picrotoxin. He has steadily improved in health and weight, the dense corneal infiltration is decreasing, the periphery is clearing and the light perception has greatly improved. It is possible that the malnutrition has involved the lens and made it opaque. While the presence of a tuberculous lesion has been positively demonstrated, there is still a suspicion that the origin may have been a mixed one. (An intravenous injection of arsenobenzol has since been given, with negative result.)

Interstitial Keratitis; Salvarsan.

Dr. Ziegler showed a second case of interstitial keratitis, which was a typical example of hereditary lues in a boy, aged nine years. The Wassermann reaction was a strong plus 4. Through the kindness of Dr. Judson Daland an injection of arsenobenzol, 0.5 gram in 15 cc. of solution was made in the gluteal muscles. There was marked cellulitis with pain, the temperature rose to 102° and remained above normal for one week. The ocular improvement was noticeable, but did not meet expectations. One month later the Wassermann reaction still remained plus 4. An intravenous injection of 0.3 gram was given, following which the improvement was marked and rapid. In a month the Wassermann had fallen to a feeble plus 1, all local symptoms had disappeared, the corneal haze was clearing and the vision had risen from nil to 6/200. So far he has had no other treatment. As the arsenobenzol has thoroughly controlled the acute, destructive lesion he will now be placed under the usual specific treatment and sent home with orders to report again for another Wassermann at the end of two months.

Discussing Dr. Ziegler's paper, Dr. de Schweinitz described a patient with double interstitial keratitis, notched teeth, and positive Wassermann reaction, vision being reduced to hand movements at 1 meter, who had been given 3 injections of salvarsan at intervals of a month, the vision having greatly improved, so that now it is 6/22 in one, and 6/30 in the other eye, and the accompanying cyclitis has disappeared, and apparently the interstitial deposits are much thinner. On the days between the injections large doses of iodide of potash had been administered. Prior to the use of the salvarsan, iodides and mercury had been given freely without controlling the disease for a period for nearly six months. He also described the effect of salvarsan in dissipating the lesions of an iritis papulosa (one large and two smaller iris syphilids at the pupil margin). They disappeared in less than two weeks. This patient, also, at the request of Drs. Siter and Uhle, who gave the injections, had received large doses of iodide of potash. Dr. de Schweinitz spoke of the advantages and reasons for combining the effect of the two remedies.

Dr. Posey referred to a case of specific uveitis in which he had observed most gratifying results following the use of salvarsan. The inflammation had been of several years' standing and had occurred in the eyes of a woman the subject of acquired syphilis. When first seen, vision was reduced to counting fingers at one-half a meter in each eye. The irides in both eyes were plastered down to the lenses, the corneæ were steamy and the tension was markedly elevated. Potassium iodid and mercury and all forms of local treatment had failed to make any impression. Forty-eight hours after an intravenous injection of salvarsan, vision rose and the local signs of inflammation decreased rapidly. About ten days later, however, a recrudescence of the acute symptoms occurred, a subsidence of which promptly followed a second injection of salvarsan. Dr. Posey stated that he considered that without the beneficial action from the salvarsan, both eyes would have been surely lost.

Secondary Glaucoma; High Frequency Current.

Dr. S. D. Risley presented for study a woman, aged thirty-five years, who had consulted him on February 20, 1911, with secondary glaucoma, the balls being stony hard—the result of recurrent iritis, possibly of rheumatic origin. There was no perception of light in the right eye, and doubtful perception in the left. There was a complete annular synechia in both eyes. In the right an atrophic iris, in the left iris bombé. Two weeks before, she claimed that she had been able to read and thread her needle with the left eye. She had severe pain in the eyes and head. Before giving a hopeless prognosis she was subjected to the high frequency current for ten minutes over the closed lids of each eye. The pain was immediately relieved, the tension reduced to + 2 and the perception of light greatly increased. She was then admitted to the Wills Hospital and an iridectomy performed, under general anesthesia, on both eyes at the same sitting. Convalescence was uneventful, but on the second day the vision rose to counting fingers at two feet with the left eye and the ability to take candle field with the right. The daily application of the high frequency current was followed by a steadily improving vision and increase of the field in the left eye. The tension in the right eye was subnormal, in the left normal. She could see her way about the ward unaided, but stumbled over chairs because of the entire absence of the field below the horizontal line. Dr. Risley presented the case as interesting from the standpoint of prognosis, which at first he was inclined to regard as hopeless and would have dismissed as such but for the signal effect of the high frequency current in relieving pain and tension and in increasing the perception of light.

Dr. J. Norman Risley related his experience with the high frequency current, in a case of an acute attack of secondary glaucoma, in which the eyeball was stony hard and the congestion and injection was so great that no absorption of medicines applied locally could take place and in which the pain was so excruciating that the patient cried out. After fifteen or twenty minutes' application of the high frequency current, administered through a vacuum electrode directly to the eyeball through the closed lids, the pain was markedly relieved and the congestion very much diminished and tension decidedly lower. Later the patient was admitted to the Wills Hospital, where the eyeball was enucleated.

Dr. Risley asked the fellows what their experience had been in the treatment of uveitis with floating vitreous opacities, with the high frequency current. He had not seen much absorption of the vitreous opacities occur or any definite improvement in the condition, though all the patients had claimed improvement in vision.

Dr. Sweet's experience in the use of the high frequency current in the relief of pain was similar to that mentioned by Dr. Risley. He had also employed the current in cases of optic atrophy, and in two instances, one of retinitis pigmentosa and one of atrophy from probable lead poisoning, there was an apparent increase in the size of the visual field.

Dr. de Schweinitz gave his experience with high frequency currents in the treatment of certain types of optic nerve atrophy: (1) Optic nerve atrophy of tabes dorsalis; (2) the optic nerve atrophy type of tabes dorsalis; (3) postretrobulbar neuritis atrophy. Some of the patients had expressed satisfaction with the result, but Dr. de Schweinitz had not been able to notice any distinct visual improvement, although certainly in one case there was, during the period in which the currents were used, a widening of the field of vision. He had, like Dr. Risley, observed a few times relief from pain in uveal tract diseases after their application, but had not tried them to reduce the tension of glaucoma, except that after Truc's observations on this subject had been published in 1906, he had made a few indifferent trials of the currents in chronic glaucoma. He had not, however, used them in such a case as had been reported by Dr. Risley, and thought his results should stimulate further trial of them under such conditions. He had tried their effects a few times in eyes with retinal hemorrhages and vitreous opacities, but had not observed any amelioration of the conditions.

Dr. S. D. Risley, in closing the discussion said the psychical element in electrical treatment must always be considered; it, like infinitesimal dosage, Christian Science et al., had a peculiar fascination for some minds. He was not in the least inclined to be dogmatic in urging the value of the high frequency current or any other as a curative agent in any form of disease of the eyes. That it would promptly reduce tension and so relieve pain in glaucomatous eyes he had, however, frequently demonstrated. He had always been in some sense a doubting Thomas as to the efficacy of any form of electricity in the treatment of ocular affections. In the treatment, for example, of optic atrophy by negative galvanism or by the high frequency apparatus he had so often failed to demonstrate by objective methods any improvement, even when his patients insisted upon marked improvement by the daily applications. He thought it extremely difficult to differentiate the psychological from physical results. It could not, however, be gainsaid that many patients are greatly encouraged and are willing to persist in the treatment because of improvement, either fancied or real.

He had not seen vitreous opacities disappear entirely under electrical treatment, but he had seen the diseases of the uveal tract improve and the acuity of vision rise under the persistent application of both the high frequency current and negative galvanism.

For explanation of such results he thought it might be due to the stimulation of the lymph currents and the circulation of the blood stream through the affected tissues, leading to improved nutrition. Whether this was produced by the electric current *per se* or by a fine vibratory impulse was open to question. He had failed to secure corresponding results by other vibratory methods or by massage.

Meeting April 20, 1911. Dr. William M. Sweet, Chairman, presiding.

Cicatricial Ectropion.

Dr. Harbridge (by invitation) exhibited a patient showing the result of plastic operation for *Cicatricial Ectropion* following burns of the two lower and left upper lids. The case was first seen at the Chester Hospital, in April, 1908. One year was allowed to elapse following the original injury, so that full contraction of the scar tissue might take place. At the expiration of this time there was a complete eversion of the two lower lids and a drawing up and out of the left upper lid, the patient being wholly unable to cover the globes and could only moisten the cornea by turning them markedly upward. In March, 1909, a Thiersch graft, taken from the arm was applied to the denuded surface of the right lower lid after first separating the scar tissue and stitching the border of the lid above to the supraorbital ridge; subsequently the other lids were treated in a similar manner at intervals of two months. Practically two years having elapsed without any shrinkage taking place the results may be recorded as permanently successful.

Probable Ring Abscess of the Cornea.

Dr. Harbridge (by invitation) also exhibited a baby, aged 3 weeks when exhibited; first seen twenty hours after birth. The right eye presented an infiltration of the entire cornea except a small area opposite the pupillary space, the deeper layers being more particularly involved and the upper portion permeated by fine bloodvessels. There was present ciliary injection and a well marked tarsal and bulbar conjunctival congestion, but no discharge of any kind. A tentative diagnosis of *Ring Abscess of the Cornea* was made. The case will be reported more fully at a future time.

Dr. Holloway stated that inasmuch as the cornea in this case appeared to be vascularized the condition could be regarded as being dependent upon a true inflammation rather than due to the result of faulty development. Von Hipple reported a parenchymatous inflammation of the cornea that was observed in a six-day-old infant and which was associated with a bilateral coloboma of the chorioid. A few years ago L. W. Callan referred to an interesting case in a baby a few days old. Here both corneæ were almost completely opaque, but under the use of dionin the opacities rapidly became less and when the infant was about a year old the corneæ were almost clear. As there was no vascularization of the cornea in this case, Callan regarded the condition as due to defective development.

Dr. Posey said that he had once been called to see a baby but a few days old whose right cornea was quite opaque throughout, that of the fellow eye being clear. No forceps had been used, and there was nothing in the history which would account for the condition.

Dr. Zentmayer said that about two years ago there was brought to him, at Wills Hospital, an infant aged about three weeks, with bilateral densely hazed corneæ. There were no inflammatory symptoms. The condition had been present since birth. It was uninfluenced by treatment which had been persisted in up to the time he last saw it when the child was about six months old.

Dermoid Cyst.

Dr. Shannon presented a case of *Dermoid Cyst* of the conjunctiva in a young colored boy, aged fourteen years. It was of a grayish-white color, situated at the outer limbus of the cornea, partly on the cornea and partly on the conjunctiva, about 6 mm. long, 3 mm. wide, with an elevation of 2.5 mm. The surface of the tumor was dry and epidermoid, presenting in its centre an umbilication from which projected two cilia. No other congenital anomalies so frequently found in connection with these conditions were discovered. The growth, as far as the patient could tell, had not increased in size for several years. It occasioned him no inconvenience.

Rupture of Chorioid.

Dr. J. Norman Risley exhibited a patient who had been struck by a snowball in the left eye two months ago. There was paralysis of the iris and an extensive sickel-shaped rupture of the chorioid, extending from a point at the upper margin of the nerve and 8 mm. to the temporal side downward to a point about the same distance below and to the nasal side of the nerve. There was also a smaller lozenge-shaped rupture between the nerve and upper part of the large rupture. There was extensive hemorrhagic chorioiditis and now beginning atrophy of the temporal half of the nerve.

Syphilitic Tarsitis; Salvarsan.

After briefly alluding to the diffuse and circumscribed (usually noninflammatory) varieties of tertiary syphilitic tarsitis, as described by v. Michel and others, Dr. A. C. Sautter related the history of a case of early, diffuse (probably gummatous) infiltration of the tarsus and adjacent glandular tissue in a colored man, aged twenty-six years, the victim of a malignant syphilitic infection.

The patient first visited the Eye Dispensary of the Pennsylvania Hospital, service of Dr. William T. Shoemaker, on December 2, 1910, about ten weeks after the appearance of the primary sore, for treatment of what seemed to be a chalazion in the left lower lid. An incision was followed by some bleeding but by no discharge of secretion. Duration four weeks.

Lesions then successively involved the upper left and the right lower lids. While in the lower lids the swellings resembled chalazia, in the left upper lid a diffuse inflammatory swelling occurred, associated with some pain and tenderness and preauricular glandular enlargement. The conjunctival surface of this lid presented shallow ulcerations, a larger marginial ulcer and a number of subconjunctival lardaceous infiltrations. The patient had been on mercurial inunctions continuously for the past three months and on March 18 a slight improvement was noted in the condition of the upper lid. Three days later an intravenous injection of salvarsan was administered followed by a rapid retrogression of all lid lesions and clearing up of the papular and rupial skin eruptions.

At the present time examination of the left upper lid shows a slight marginal swelling of the tarsus with considerable induration, also cicatrices in the tarsal conjunctiva and a roughened, needle-stuck area, devoid of cilia at the site of the former marginal ulcer. The other lids appear normal.

The Strabismus Hook in Lacrimal Sac Operations.

Dr. Edward A. Shumway read a paper in reference to the efficiency of the *Strabismus Hook in Lacrimal Sac Operations.* The original appears on page 539 of this number.

Dr. G. E. de Schweinitz said that he had not found it necessary to inject the sac with paraffin or other substances in his operations, but had almost always been able to remove it without difficulty. He was, however, greatly impressed with the value of Dr. Shumway's suggestion, and had found a strabismus hook of the greatest possible use in locating the sac.

Dr. Posey said that since he had strictly followed Mellor's method in the removal of the lacrimal sac, he had but little difficulty with the operation and there was practically no hemorrhage. The landmarks for the location of the sac which he always sought for were the internal palpebral ligament and the inner margin of the orbit, as they at once determined the location of the top of the sac and of its inner wall. The only difficulty remaining was the separation of the outer wall from the surrounding tissues, and he thought Dr. Shumway's suggestion would be of help at that time. He cautioned against perforating the sac with the needle of the Pravaz syringe when injecting the solution of novocaine and adrenaline, as he had several times been somewhat embarrassed in the removal of the sac by this accident.

Small Round Cell Sarcoma of Sheath of Optic Nerve.

Dr. Posey gave the detailed notes of a case, presenting a growth of this nature, which can be consulted in full on p. 527 of this number.

Dr. Shumway detailed the history of a boy with an orbital growth situated below the eyeball, which he had recently removed by an incision through the lower lid. The primary result had been good, the exophthalmos amounting to 14 mm. had disappeared, and vision had risen from 6/30 to 6/7.5. The report of the microscopic examination had not been received. Commenting on the conflicting diagnoses of the pathologists in Dr. Posey's case, Dr. Shumway referred to the difficulty of distinguishing at times between round-celled sarcomata, lymphomata, and various inflammatory conditions, and thought that some of the cases of unilateral growths, whose removal was not followed by recurrence might be classified under the head of pseudotumors, as had been done by Birch-Hirschfeld in his article on Diseases of the Orbit in the *Graefe-Saemisch Handbuch*. The reports of such cases, and the good result in a recent case operated on by Dr. de Schweinitz, at the University Hospital, in which there had been no recurrence, although the pathological diagnosis had been sarcoma, had induced Dr. Shumway to be conservative, in the present instance, and not to sacrifice at once an eye with good vision.

Dr. Sweet referred to a case of sarcoma of the orbit in a healthy young man, in which there had been no return of the growth three years after complete exenteration of the orbit, although at the operation there was found caries of the superior wall of the orbit and perforation of the dura. Röntgen ray treatment had been employed for a long period, and the patient is at present in perfect health.

Dr. Hansell stated that the first important consideration in the management of orbital tumors is the diagnosis. As an illustration of this he stated briefly a recent experience. A colored woman had the usual signs of tumor: Gradually advancing proptosis, limitation of movement, and frequent prolonged pain of moderate severity. An incision was made through the lid just below the orbital border, and the underlying fascia and muscles carefully dissected. A dense fibrous membrane, which was thought to be the capsule of a sarcoma, was opened after vain attempts to determine its limitations. Several ounces of thin greenish-yellow pus poured out from the opening. After thorough expression and cleansing it was found that a large communication through an area of necrosed bone, connected the orbit with the frontal sinus. The membrane, mistaken for the capsule, was the orbital periosteum which had been pushed downward by the accumulation of pus. Subsequently drainage was established through the nose by Dr. Fielding Lewis who has the patient still under treatment, and the eye recovered almost its normal position.

Dr. Posey agreed with Dr. Hansell that the diagnosis of orbital tumors was generally most difficult and particularly between affections of the sinuses and neoplasms of the orbit. The presence of proptosis always awakened in his mind the possibility of sinus disease, and every case was subjected to a searching rhinological examination. As in the case reported by him, however, the report of the rhinologist often failed to be conclusive, and he referred to another instance where a mucocele of the frontal cells presented all the characteristics of an orbital sarcoma.

Anomalous Condition of Retinal Vessels.

Dr. Wm. Campbell Posey exhibited a water color sketch of a fundus in which the entire posterior portion was occupied by a mass of enormously dilated and convoluted retinal arteries and veins. Thick white lines accompanied both sets of vessels, probably the result of a previous perivasculitis, while small bright red arteries which apparently emerged from the hidden disk were doubtless of comparatively recent formation. The fundus in the fellow eye was normal. Both eyes were moderately hypermetropic. Vision in the affected eye equalled 5/9, in the fellow, 5/5. The field was considerably contracted to the nasal side and two round scotoma 10° in diameter occupied the temporal portion. Vision in the affected eye had been poor since birth, and as careful inquiry failed to reveal any cause which could have occasioned the change in the fundus, and as the vessels in the fellow eye were normal, Dr. Posey was inclined to attribute the changes to a congenital malformation, probably of the nature of a varix.

Ophthalmodiaphanoscope of Hertzel.

Dr. Howard F. Hansell exhibited the *Ophthalmodiaphanoscope of Hertzel* and referred to its clinical efficiency. The original can be consulted on page 534 of this number.

Some Cases Illustrating Intraocular Lesions Following Blows Upon the Eye.

Dr. G. E. de Schweinitz reported the following cases:

Case I.—*A Traumatic Fissure of the Chorioid Followed One Year Later by Extensive Massive Exudation.* The injured eye, the right one, was struck by a piece of wood, the immediate effect being two somewhat irregularly shaped fissures in the chorioid in the temporal region, surrounded by a few scattered retinal hemorrhages, reducing the vision to 6/22. One year later the patient reappeared with the entire macular area covered with a greenish-white exudation 4½ disks' diameter in breadth and nearly 3 disk's diameter in width, elevated 6 D. above the level of the eyeground, whitish in its centre, greenish on its margin, and dotted here and there with delicate incrustations of pigment; while on its surface and surrounding it were numerous hemorrhages, and on some of the smaller vessels aneurysmal dilatations. He compared this lesion with the so-called massive retinal exudation described by Coats, but thought that inasmuch as the process had begun in the chorioid, it was more likely similar to those lesions which have sometimes been caused by indirect injury of the eye, for example, by the passage of a bullet through the orbit, where, with ruptures of the chorioid and retina, hemorrhage had taken place between these two structures and between the retina and vitreous, resulting in a plastic inflammation, with the production of layers of laminated fibrous tissue between the chorioid and retina, a condition of affairs, for instance, as has been described by Nettleship.

Case II.—*Traumatic Detachment of the Inferior Portion of the Retina Sharply Bounded by a Line of Pigmented Chorioretinitis.* The detachment was seen nine months after the injury had occurred which happened during a game of football, the right eye being affected, the refraction hyperopic. The lower half of the retina was detached, but the separation did not extend above the level of the lower border of the optic nerve, and the entire upper border of the detachment was sharply limited by a long striation about twice the width of a retinal vein, bounded by pigment, and terminating in the nasal half of the eyeground in a patch of pigmented retinochorioiditis. A smaller pigmented striation had been formed at an acute angle with the other. Dr. de Schweinitz pointed out how this line of chorioretinitis had pinned down the detached retina and prevented its extension, and in connection with it he discussed the so-called retinitis striata, a disease which has been ascribed to the metamorphosis of retinal hemorrhages, but which Caspar had interpreted as representing the final stage of spontaneously cured retinal detachment, and showed a water color illustrating one of these so-called retinal striations which he had observed in its formation during the subsidence of a spontaneous detachment of the retina in a myopic eye.

Case III.—*Chorioretinal Rupture with Extensive Retinal and Vitreous Hemorrhages Following the Blow of a Fist upon the Eyeball.* The right eye was affected, and the ophthalmoscope revealed a large, irregularly-shaped hemorrhage, beginning at the outer margin of the disk and extending to the nasal side about ½ disk's diameter, from whence it passed upward and above the disk for another disk's diameter. From the main body curious knob-like protuberances of hemorrhagic extravasation were visible, while finer scattered hemorrhages existed above the disk and between it and this mass of hemorrhagic exudation. From the lower end of the larger hemorrhage a long black mass protruded forward into the vitreous, and to the temporal side of this cord-like extension, as well as below the disk, there was a large area of drop-like hemorrhages banked up especially along the sweep of the inferior temporal vein. With one branch of this vein a large sac-like hemorrhage was connected. Up and in from the first described hemorrhage a large area of greenish-white edema was visible. This covered what later proved to be an extensive chorio-retinal rupture which extended in this direction and beneath the previously described largest hemorrhage. The vitreous was cloudy and thick blood-clots floated through it. The ultimate result was excellent, a vision of 6/9 having been secured.

CASE IV.—*Unusual Exudation Covering the Head of the Optic Nerve Following a Blow with a Stick.* The patient, aged nineteen years, was examined twelve years after the accident. The eye was totally blind and divergent. The media were clear, both sets of vessels small and the entire area of the disk, that is to say, the surface of the papilla and some of the region beyond it, was occupied by a greenish-white tissue, probably exudative in character, which was fringed with a collar of pigment, more produced to the temporal side than elsewhere. From the margin of this greenish-white exudation the vessels were seen to emerge in such a manner that the appearance was exactly as if the greenish-white exudation represented a very large atrophic papilla, save only that the vessel instead of entering and emerging at the porus found their positions at the margin of the disk. The eye was myopic and the exudation not much elevated above the level of the fundus.

Anomalous Excavation of the Optic Disk.

Dr. G. E. de Schweinitz exhibited a drawing illustrating the fundus appearances of the right eye of a colored child, aged fourteen years. The vision after the correction of a hyperopic astigmatism was 6/7.5, in spite of some scars the result of a former phlyctenular keratitis. The upper half of the disk contained a large, deep cup, about — 3 D. From beneath the upper margin of this cup the retinal vessels proceeded, that is to say, the arteries passed out and the veins entered, exactly as they would beneath the margin of a glaucomatous cup, while the lower vessels acted in like manner, except that the edge of the cup was not so sharply marked as the upper one. In other respects the distribution of the vessels was practically normal.

Dr. de Schweinitz briefly discussed the various anomalous excavations of the optic nerve, and pointed out that except that it was somewhat smaller in size and had a somewhat different situation, excavation resembled the so-called colobomatous excavation of the papilla, particularly as it has been figured by Adolf Szili.

T. B. HOLLOWAY, Clerk.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of February 16, 1911. The President, Dr. H. W. Woodruff, in the chair.

Further Report of an Orbital Tumor of Ten Years' Standing; Endothelioma.

Dr. C. A. Leenheer presented a woman of 34 whom he had exhibited at a meeting of the Society five years ago. The patient had an endothelioma of the orbit which had been growing for about ten years. Examination at the present time, nearly six years after the Kroenlein operation had been performed, shows that the eye protrudes about as much as before the operation. The lids cover the cornea, the conjunctiva is injected; the pupil does not react to light; there is secondary optic atrophy; general health is good. Since the operation she has had three children. There has been no evidence of metastasis. Pathological examination by Dr. Zeit showed a *hemangioendothelioma perivasculare.*

Dr. Richard J.Tivnen, in discussing the Kroenlein operation, inquired if Dr. Leenheer had had any difficulty in separating the bone with a chisel.

Dr. Leenheer replied that the operation had been performed by Dr. Schroeder without difficulty.

Patient With Unusual Fields of Vision.

Dr. Thomas Faith reported the case of a woman of 23 with irregular constriction of the form fields. The field for red was constricted in the upper portion and those for red and green could be seen only in an area of 20 degrees in the inner, lower and outer fields. There was an absolute central scotoma for green and blue. There were no evidences of fundus lesions, nor were there any manifestations of hysteria or insular sclerosis. Vision equalled 20/50. The fields taken repeatedly showed the same result.

Unusual Case of Buphthalmus.

Dr. Major H. Worthington showed a girl of 18 who entered the service of Dr. Willis O. Nance at the Illinois Eye and

Ear Infirmary several weeks ago, with a marked buphthalmus of the left eye. The eye is about two and one-half times larger than normal. The thinned sclera presents a decided bluish tint throughout the entire anterior ocular segment. Tension is normal and vision equals shadows. The patient was seen nine years ago by Dr. E. K. Findlay who diagnosed the case as one of tuberculous keratitis. An iridectomy had been done in 1905 by Dr. T. A. Woodruff which brought about a reduction in the ocular tension, and improved the then existing vision. The increase in the size of the eye, as noticed by members of the patient's family, has rapidly increased for six years, the right eye has a decided thinning of the anterior structures with bulging and appears to be taking the same course as the left eye. Vision in this eye is reduced to the perception of shadows. Von Pirquet test was positive. Therapeutic doses of tuberculin are being administered. Dr. Worthington believed the prognosis to be exceedingly grave.

A Case of Antepartum Purulent Ophthalmia.

Dr. Willis O. Nance reported the case of an infant who entered his service at the Eye and Ear Infirmary one and one-half days after birth with the following history: Three hours after birth, as seen by Dr. Hugh Blake Williams, the eyelids were swollen and red, the bulbar conjunctiva was deeply injected and thin pus was exuding from both eyes. This condition was observed by the attending obstetrician at birth. The mother had had a profuse leucorrhoea for several months. One week before labor, there had been rupture of the amnion with discharge of waters. The baby weighed four pounds. After admission to the hospital, the ocular symptoms increased in severity and both corneæ became involved, one of which perforated with evacuation of the lens. At no time was it possible to demonstrate the gonococcus. The patient was discharged from the hospital three weeks after admission. The cornea of one eye is clear except for a small scar; the other is leucomatous.

The case is the second one of antepartum ophthalmia that Dr. Nance has observed, the other being one that he reported to this Society in 1907.

Dr. Thomas Faith was called to see a patient with antepartum conjunctivitis several years ago, in consultation with the attending physician. There was a well-marked purulent conjunctivitis at birth. The bag of waters had ruptured several days (five days?) previous to labor. The gonococcus was demonstrated in the discharge from the baby's eyes. The case ran a favorable course and terminated with a slight opacity of one cornea only.

Dr. H. S. Gradle inquired whether the genitalia of the mother, in Dr. Nance's case, had been examined and whether there had been any specific stains used on the secretion of the child, or if examination for the chalamydozoon of Prowazek had been made.

Dr. Nance, in closing, called attention to the study of the disease by Sydney Stephenson and believed with this observer that cases of antepartum purulent ophthalmia are not nearly so uncommon as has been generally believed. He also believed that many of the cases of so-called congenital ocular anomalies, as corneal staphylomata, microphthalmos, corneal opacities, etc., might be accounted for by intrauterine infection. In answer to Dr. Gradle's questions he stated that no examination for the Prowazek microorganism had yet been made.

Simple Hypertrophy of the Tarsus.

Dr. M. H. Lebensohn presented a woman of 51 with a swelling of the right upper eyelid, noticed for the first time a little more than a year ago. There had been no pain at any time and the conjunctiva was and had been normal. The patient came to the Infirmary clinic because she could not open the eye as well as the other. The family and personal histories were negative. The diagnosis of simple hypertrophy was made, as no inflammatory symptoms had ever been observed.

Dr. E. V. L. Brown inquired if the Wasserman test had been made.

Dr. C. J. Swan called attention to a case he had presented to the Society three months ago which was bilateral, and the tarsi so enlarged that it was impossible to evert the lids. In this case, the specific therapeutic test has been made and also a von Pirquet test, both of which proved negative. The patient experienced practically no inconvenience from the condition.

Dr. Lebensohn, closing, stated that no Wasserman had been made. The history was positively negative and besides in specific tarsitis there is an inflammation at some time, a condition which has never been present in this case.

Bilateral Marginal Thinning and Ectasia of Cornea.

Dr. Milton H. Schultz (by invitation) presented a young man of 18, who came to the Eye and Ear Infirmary with a perforation of the cornea of the left eye with prolapse of the iris along the upper inner margin. He gave a history of attacks of inflammation of the eyes occurring off and on for two years. The morning of the entry to the hospital, he was awakened by pain in the left eye. Examination revealed a perforation with prolapse of the iris along the upper inner margin of the left cornea. Eserine ½% and pressure bandages were ordered. Two days later, the patient complained of a sharp pain in the right eye and examination showed a crescent-shaped peripheral ectasia and thinning of the upper inner quadrant of the cornea which seemed in imminent danger of perforation. It was bordered centrally by a saturated gray line of opacity. The bulged portion was translucent and covered with fine superficial branching vessels and was distinctly anesthetic.

The left eye then presented an exactly analogous area of peripheral thinning with less bulging. The perforation measures 2x1 mm. at axis 135° and involves the body of the iris from its root to its pupil border. The pupil was pear-shaped. Vision in each eye is practically normal (10/10-3). The ophthalmometer shows an astigmatism of approximately 1 D. Morax-Axenfeld diplobacillus and staphylococcus albus were grown from the conjunctival sacs.

Under pressure bandages and eserine, the marginal ectasia of the right cornea remained unchanged for ten days, then suddenly and entirely disappeared leaving only a flattened area of very thin cornea. The hernia of the left iris was flattened to its former height, so that it barely projects over the level of the rest of the thinned area. The tension is a little below normal (9 mm. Schiötz tonometer).

The case is unusual in (1) the early age of the patient (18 years); (2) the entire absence of an arcus senilis, and (3) the disappearance of the ectasia while under observation.

Dr. Oscar Dodd: This case has interested me very much because of the rare condition and the fact that I have had only one other like it in my practice. The right eye has presented some unusual features. By some error, the eserine was not used for two or three days, there occurring then a marked ectasia with a drawing-up of the pupil, making it oblong. I immediately had the eserine and a compress bandage used, and the next time I saw him—two days later—the pupil was normal in size and the ectasia was much less. The reduction of the ectasia under the use of eserine and bandage has been very marked in both eyes, as the cornea at that point has come back to about the normal curvature.

Dr. E. V. L. Brown said that Seefelder's finding of granulation tissue in the anterior half of the cornea corresponding to the thinned area is of great importance when taken in conjunction with the fact that scar tissue was entirely absent; if an inflammatory process had preceded, scar tissue would have developed. His finding of extensive fatty degeneration of the portion behind as widely as into the clear central cornea just as in arcus senilis, is strong corroborative evidence that Fuchs' view that the two processes are similar in nature, is correct.

Cyst of the Orbit with Some Interesting Features.

Dr. Richard J. Tivnen reported a case-history of a patient who had a tumor of the orbit. The patient had observed about a year and a half ago a localized swelling to the nasal side in the tissue of the upper eyelid of the right eye. It was the size of a small pea, was never reddened, inflamed, painful nor tender to the touch. It has noticeably increased in size since last August. Since the age of 18, the patient has had several growths removed from the scalp at different times which were hard "like a stone."

Examination discloses a soft freely movable mass slightly larger than a pea, located rather deeply in the soft tissues behind the upper lid just beneath the inner supraorbital arch. The mass does not pulsate, is freely movable, is not attached to the globe or lid structures and is not tender on pressure. No exophthalmos or malposition of globe. Palpebral aperture of right eye is noticeably smaller than that of the left, measuring about 6 cm. in the former and 8 cm. in the latter. Vision O. D., 20/50ths.

Inversion of Iris; Pathologic Specimen.

Dr. H. B. Young, Burlington, Iowa: The eye which I have on exhibition was enucleated about 4 weeks ago because it was totally blind, and in hypertension. It contained a dislocated cataractous lens which floated about like a cork in a bottle of water and had an intractable corneal ulcer. The history was briefly as follows: R. R., aged 56, a forester, while felling trees 17 years ago was struck on the left eye by a rebounding tree-limb. The pupil was "scattered" and never restored. Two years later vision was lost. There was no real trouble until four months ago when this eye became inflamed and painful and the other eye weak. The eye has been better and worse since then, but never well.

Treatment for a week with pilocarpine and antiseptics was without lasting result. The interesting feature in the specimen is the probable inversion of the iris. The lens no longer floats because of 4% formalin in the preservative. The possibility of the dislocated lens acting as a foreign-body was an additional consideration for enucleation. The right eye is no longer weak and the patient expresses himself as in better condition than at any time in the past year.

Unilateral Vernal Conjunctivitis.

Dr. C. H. Beard exhibited a woman of 26 with a vernal conjunctivitis of one eye. The disease was of the "mixed" type, being oculopalpebral. Duration of the disease had been two years. The case was unique in that the disease appeared so late in life and was unilateral.

Meeting of March 20, 1911. Dr. H. W. Woodruff, President, in the chair.

Some Experiences with Trachoma in the Orient.

Dr. Casey A. Wood delivered a highly instructive and entertaining address, illustrated by lantern slides, on this subject. His remarks treated mainly of the sociologic aspects of trachoma with reference to the alleviation and possible eradication of the disease.

A Case of Iritis Treated with Salvarsan.

Dr. Willis O. Nance presented a man of 20 who developed an acute iritis ten days before admission to the Eye and Ear Infirmary, and who gave a specific history and exhibited all the characteristic signs of syphilis. The infection occurred three months before. On admission, the eye presented all the typical symptoms of a deep iritis. There was a pronounced ciliary injection and the pupil when dilated became decidedly irregular. No constitutional treatment had been employed. The patient was a robust young man free from nephritic or cardiac disease. Under Dr. Nance's direction, Dr. C. E. Smith, house surgeon at the Infirmary, injected 0.6 gm. salvarsan deeply into the gluteal region, employing Wechselmann's method. The patient was kept in bed three days. There were no untoward symptoms. Twenty-four hours after the injection, the eye was markedly clearer and a mucous patch in the mouth had entirely cleared. There was a diminution in the adenopathy forty-eight hours after injection, the eye appeared normal except for the irregular pupil. A course of hydrargyrum is to be instituted in the case at once. Dr. Nance considered the rapid clearing of the eye, the healing of the mucous patch and the subsidence of the adenopathy as little short of magical.

Dr. Cassius D. Westcott said that so far as he knew only one patient of his had been subjected to treatment with salvarsan. The patient was a man who gave a very indefinite history of syphilitic infection, although a Wassermann was positive. The only ocular lesion was a paralysis of one external rectus. A diagnosis of cerebral syphilis was made and he was given mercury for many weeks without effect and finally one injection of salvarsan with similar result. The remedy was given without Dr. Westcott's consent. Dr. Westcott is of the opinion that we should be exceedingly cautious in recommending salvarsan, especially without the advice of an expert syphilographer.

Dr. Casey Wood believed that while the use of salvarsan was especially valuable in the more recent lesions of the ocular apparatus, it still remains to be decided (1) whether "606" is of any considerable use in affections of the oculonervous apparatus, and (2) whether in its employment in such cases the danger of optic neuritis and atrophy has been exaggerated or not.

Dr. H. W. Woodruff has had no personal experience with "606," but as there have been cases which terminated fatally following its use, he made the suggestion that unless the case was one which required an immediate effect that it might be better to give smaller doses and not subject the patient to the danger of sudden death.

Dr. Nance, in closing, said that naturally a compound, thirty per cent of which is arsenic, must not be used carelessly or with impunity, nor should it be employed to the exclusion of the classical mercury and iodid regimen. The rapid and striking results in the case reported were considered by the speaker as of more than passing interest.

A Case of Parinaud's Conjunctivitis.

Dr. Nance also presented a case of this rare disease. The patient was a girl of 8 years, who presented the typical appearance of Parinaud's disease as described in the latest edition of Fuchs. Six weeks ago, the mother noticed a swelling behind and below the right angle of the inferior maxilla. The right eye a few days later became inflamed. The upper lid is swollen and edematous. There are many areas of granulation tissue in and near the fornix. Near the lid margin are two superficial gray-coated ulcers, and in the outer half is a triangular area of diffuse ulceration about 7 by 5 mm. On the lower lid are 3 superficial gray-coated ulcers near the margin. On the limbus to the nasal side there is an oval nodule 2½ by 2½ mm. The preauricular gland is larger than a good-sized almond and the parotid gland is enlarged. The child lives in a flat and has not come into contact with any animal. The personal and family histories are negative.

Dr. W. G. Reeder has seen two cases of Parinaud's conjunctivitis. One was in the practice of the late Dr. Hotz, the other was under the care of Dr. F. I. Brown. Both cases were unilateral and occurred in little girls. Recovery resulted in one of the cases which remained under observation, after three months.

Successful Removal of Steel Encapsulated in the Ciliary Body.

Dr. Robert von der Heydt presented a man of 44 whose left eye had been injured by a piece of steel. Several weeks after injury, a skiagram showed a piece of steel to be present. The position was indicated as being on the temporal side of the corneal border, while it was later found to be exactly below, where a scleral response to the magnet was elicited. After an hour's effort to draw the steel back into the anterior chamber, without result, an attempt was made to move it back toward the vitreous. It was impossible to dislodge the steel body, which seemed well encapsulated and just under the sclera, three millimeters below the corneal border. A small incision was then made, as in cyclodialysis, at a point judged to be posterior edge of the steel. While always responding to the current, it resisted removal and it was necessary to enter a spatula between it and the sclera as used by Heine in cyclodialysis. After a total of two and a quarter hours' effort, its removal was finally accomplished through the small incision. In its exit it drew down the root of the iris toward the wound. The wound was cauterized, conjunctiva sutured and eserin instilled. Vision of 20/40 was obtained notwithstanding there was a corneal nebula and eccentrically drawn pupil.

Dr. Wood said that it is well in cases where large and medium-sized pieces of steel have been removed from the neighborhood of the ciliary body to defer a definite prognosis until a year after the removal of the foreign body. It nearly always happens that septic material is carried into the interior of the eye which even after months may be responsible for a more or less distinctive uveitis.

Dr. Westcott congratulated Dr. von der Heydt upon the brilliant result which he obtained in this case. It illustrates the undesirability of depending upon the patient's statement that there can be no foreign body in the eye after the accident. It is always best to have a radiogram taken at once in all cases where a foreign body may be present in order that it may be removed at once if one is found. The longer we wait, the greater the difficulty and danger of the operation. He believed it is always wise to select the scleral route for the removal of a large foreign body behind a lens that has not been injured.

An Unusual Case of Superficial Keratitis.

Dr. Major H. Worthington presented a man, aged 52, laborer, whom he first saw at the Eye and Ear Infirmary on the service of Dr. Willis O. Nance in November, 1910. He had a superficial keratitis, and the usual subjective symptoms, the ulceration stained but lightly with fluorescein, and had the appearance of flakes of mucus attached to the central and upper parts of the cornea, as though a brush had been drawn across the cornea from above downward, leaving a ragged surface. He was put on the routine treatment for corneal ulcer, i. e., atropin, heat, argyrol and salicylates internally. In the course of a week or ten days' treatment, the cornea became as clear as before and all symptoms subsided. The first week in February, he suffered another attack of this condition in the same eye, which being more severe, he was put in the hospital for treatment and observation. The same picture presented as before, except that the ulceration stained more than previously. In five days, the eye was much improved, redness gone, cornea clear except for a slight macula remaining. He was discharged from the hospital much improved after one week's treatment. Later he came to the clinic with the third attack of this condition in the same eye, with the same appearance of the eye as before. At present the cornea is clear and the symptoms have subsided; there is nothing to be seen but two punctate scars on the cornea. Dr. Herbert Walker reports, from the laboratory, that the smear shows xerosis bacillus; the culture has not yet been reported on. Fuchs describes a form of keratitis, in which the epithelial layer alone is affected; fine filaments are formed which adhere at one end to the cornea and the other end, swollen and club-shaped, hangs down.

Detachment of Chorioidea Following Cataract Extraction.

Dr. E. V. L. Brown exhibited a man whose lens had been removed within the capsule (by accident) with the loss of considerable fluid vitreous thirteen days ago. The wound closed promptly and the anterior chamber was of nearly normal depth the day after the operation. Fresh blood in the pupil area obscured a view for over a week, since which time the chamber has gradually decreased in depth until it is now about one-half that of the other eye. One finds the wound closed and the tension below normal. Focal light shows four smooth sail-like bulgings of the retina and chorioidea towards the nasal center of the cavum oculi. The temporal and nasal detachments almost touch each other and leave only a vertical slit between them—above and below another knuckle of the centrally bulged tunic is seen. The areas of detachment correspond to the portions of the chorioidea between the four vena vorticosa. The anterior third of the detached areas is brown and looks like the surface of a hazel-nut from which the shell has been removed. The posterior two-thirds is covered over by a thin whitish filmy membrane corresponding to the position of the retina and through which the darker reflex of the chorioidea shimmers. The ora serrata is very clearly seen. A red reflex is to be had above only and perception and projection of light, which were normal before the operation, are now only present below. Vision before the operation was 5/200.

Dr. Westcott said it had been his practice to disturb the eye as little as possible during the first two days, and he has never thoroughly examined an eye with the ophthalmoscope during the first week after cataract extraction. In at least two instances which he was able to recall, he had seen the anterior chamber behave as Dr. Brown described, when the wound seemed perfectly closed, and it is possible that the chorioid was detached in these cases, but he refrained from sufficient examination to disclose the fact.

If, as Dr. Brown tells us, the chorioid may reattach spontaneously in a few days, it is quite possible that he may have had other cases.

Dr. W. A. Fisher does not see such cases because he always makes a preliminary iridectomy and does not see any reason for making any examination of the eye the next day after the operation. He does not see where the patient would be benefited by an examination of the eye the next morning after the operation, but a great deal of damage could be produced by simply opening the eyes at that time. If a simple operation is performed, or an iridectomy is made at the time of the operation, there is some excuse for looking at the eye the next morning after the operation, but only to see if there is a prolapse of the iris. If a preliminary iridectomy is made with a cataract operation four weeks later, he sees no excuse for looking at the eye for several days.

A Case of Pulsating Exophthalmus.

Dr. C. P. Schenck presented a patient from the service of Dr. W. H. Wilder at the Eye and Ear Infirmary. He had been struck on the back of the head about ten months ago, causing a depression of the bone. This had been raised and a silver plate introduced at the site of the injury in the left parieto-occipital region. About three months later, the patient was again struck on the back of the head, rendering him unconscious. After an interval of ten weeks, the right eye began to protrude, followed in three weeks by pain in the eye and a watery discharge. The patient entered the Infirmary four months ago. The right eye protruded more than one-half its diameter, and was immobile divergent; the pupil was dilated and fixed; there existed a conjunctival ciliary injection, marked chemosis, inability to open the lids, and the tension was slightly plus. There was pain in the right side of the head. Vision, 20/40. Hearing normal; no facial palsy. He complained of continuous noises in the right side of the head. A high-pitched bruit, which was synchronous with the heart beat, could be distinctly heard all over the patient's head. Bruit and pain disappeared by compression of the right common carotid artery upon the transverse process of the sixth cervical vertebra.

One month after admission, the common carotid artery was ligated. The bruit was not present at completion of the operation. Ten days later the exophthalmus was reduced to one-fourth the diameter of the globe and there was a slight recovery from the third nerve paralysis. There was no bruit. Three weeks after ligation the iris reacted to accommodation, but not to light. Six weeks later, the patient complained of hearing hissing noises in the head, but these were not perceptible to the ear of the examiner. A month later a bruit on the right side of the head synchronous with the heart beat could readily be heard with the stethoscope. At the time of presentation there is still a slight degree of exophthalmus. The power of the muscles supplied by the third nerve is largely restored.

Dr. Dodd: At the same time this man was in the Infirmary I had a case giving a similar history. My patient was held up and slugged, rendering him unconscious for some time. This was followed the next day by a facial paralysis. He went to the Cook County Hospital which he left in a few days as his condition did not improve. After staying at home about a month, he came to the Infirmary with a panophthalmitis of the left eye, great proptosis, and swelling about the eye.

Not being able to get a good history on account of the interpreter, I supposed the injury was to the eyeball, and that the proptosis was due to the infection. I enucleated the eye but the swelling of the conjunctiva did not subside for a long time as it was pushed out between the lids. After getting him in fair condition, he went home, but returned in about two weeks with congestion of the right eye, associated with some secretion. The secretion subsided under treatment, but the congestion of the eyeball grew worse, and upon examination I found the retinal vessels also very greatly engorged and tortuous. He complained of severe headache, and upon listening, I could hear a distinct bruit over the most of the head. By sending for a good interpreter, I then learned that the left eye had become proptosed in the same manner and that the infection producing the panophthalmitis was caused by the exposure of the cornea. I had Dr. Halsted operate on him and he made a complete recovery. The Doctor later did an anastomosis of the nerves to cure his facial paralysis.

Dr. C. E. Smith: At the time of ligation of the right common carotid artery by Dr. Bevan, the question was asked, "Why not ligate the right internal carotid artery only, since it is only this artery which is involved?" The reply was that such a procedure would cause too great an anemia of the brain, with danger of necrosis following. The reason for this is that following ligation of the common carotid artery, there is a small amount of blood which enters the carotid artery which has an extensive anastomosis with its fellow of the opposite side. Later on, if pulsating exophthalmos recurs, due to an extensive compensatory circulation being established through the old aneurysmal sac, the internal carotid artery may be ligated with less danger because along with this compensatory circulation through the internal carotid artery, there will also have been established compensatory circulation between other intracranial arteries. Dr. Wilder expects to have the right internal carotid artery ligated in this case as the next step in the treatment. WILLIS O. NANCE, *Secretary.*

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of February 18, 1911, in Denver. Dr. William A. Sedwick, presiding.

Hemorrhagic Neuroretinitis.

Dr. G. H. Strader presented a man of thirty-one, with a history of syphilis contracted in July, 1907, and treated at one of the hot springs resorts. In July, 1910, severe persistent pain had developed in the right occipital region. On the following December 19th an osteopath operated on and packed the nose with gauze. Two days later vision was suddenly lost, and a marked neuroretinitis of each eye was found on examination. Iodides were administered, 15 to 90 grains t. i. d., followed by mercury. Aspirin, 60 to 120 grains three or four times a week, was also given. Nasal suction had always relieved pain, and its use was followed by increase of vision from fingers to 20/200. The specific treatment had shown no appreciable benefit.

Discussion.—Dr. Hosmer would consider the possibility of cerebral involvement if there was marked choking of the disk.

Dr. Neeper related two cases of syphilitic papillitis, one binocular and the other monocular, with blindness. Vision was restored after cleaning out the ethmoidal and sphenoidal sinuses.

Dr. Walker thought that this case would show syphilitic and ethmoidal or sphenoidal involvement.

Dr. Strader had found the sphenoid usually involved in cases of severe occipital pain.

Optic Atrophy.

Dr. D. H. Coover re-exhibited the little girl shown before the Society in December, 1910, with retrobulbar neuritis of the left eye. Atrophy supervened. The left ethmoid had been emptied of a small amount of muco-pus, without benefit to the eye. Two or three weeks later the right eye suddenly became involved, and vision failed rapidly. Optic neuritis was now established in this eye. The child was unduly stout, but physical examination was negative. The family history was good.

Dr. C. E. Walker presented an undersized youth of twenty, showing double optic atrophy. No syphilitic taint was evident. All the boy's uncles were undersized, and his father was reported to have been a victim of alcoholic insanity. The patient was of the neurotic type. As a child he had external rectus paralysis, from which he recovered. At seventeen years examination showed emmetropia, orthophoria and V. = 20/20. In December, 1910, diabetes insipidus was found. The right eye turned up and out, causing diplopia and nausea. R. V. = fingers at 6 inches; L. V. = 20/200. Appropriate treatment for two months had been followed by R. V. = fingers at 6 feet; L. V. = 20/50.

Discussion.—Dr. Jackson suggested hypophyseal involvement, with underlying defective nutrition, in both these cases.

Dr. Neeper's first impression of these cases was of hypothyroidism, though it was not cretinism, evidently. He thought a latent toxemia possible, and would have the cutaneous test made for tuberculosis and the Wassermann reaction taken.

Traumatic Mydriasis.

Dr. D. A. Strickler showed a boy of 14 years who had been struck on the left eye two weeks before, the blow resulting in a dilated pupil, without diminution of central vision. An area of chorioidal disturbance, with pigmented margins, was seen one disk diameter above, and about the size of, the nerve head, but quadrilateral in shape. Dr. Strickler desired an expression of opinion as to the probable cause of the chorioidal change, and the permanency of the mydriasis.

Discussion.—Dr. Neeper judged the chorioidal lesion to be of long standing, and thought it might be two or three months before the pupil returned to its normal size. He believed the circular fibers were damaged, perhaps some of them ruptured: that they healed, and that their function was restored by light reaction.

Dr. Jackson said that the pathology was unknown: probably paralysis of the nerve endings. He thought recovery probable in this case.

Dr. Coover related the case history of a boy whose pupil became dilated as the result of a blow, last July, and was still larger than its fellow. He believed traumatic mydriasis might or might not be followed by recovery, and that cataract was likely to develop later. He attributed the dilatation to damage to the sphincter pupillæ.

Dr. Walker believed that the ciliary branch of the third nerve was affected, and had noted full recovery in some cases, but only partial in others.

Dr. Crisp related a case in which the reduced accommodation and enlarged pupil still persisted four months after a blow on the face.

Drs. Bane, Jackson and Libby thought the chorioidal lesion was an old one.

Iridodialysis.

Dr. Strickler also showed a man of twenty-one who had been struck in the left eye, June 13, 1910, resulting in severe intraocular hemorrhage and iridodialysis, involving about one-third of the circumference of the iris. The case rapidly improved until vision reached 20/50, a slight vitreous haze from hemorrhagic debris remaining. Two months after the injury the patient contracted syphilis; and three months later L. V. = 20/100. The lens capsule had a peculiar wavy appearance, which Dr. Strickler thought accounted for the decreased vision and probably presaged traumatic cataract.

Discussion.—Dr. Jackson thought this lens would probably become opaque.

Dr. Walker said that capsular rents did not necessarily cause opacity of the lens.

Dr. Strickler spoke of a case of traumatic lens opacity which had cleared; but cataract subsequently developed.

Dislocated Ring-Shaped Opaque Lens.

Dr. Edward Jackson presented a man of fifty-six, with dislocation of the lens into the anterior chamber. In boyhood the eye had been struck. Light perception only remained. A much more recent blow was followed by change in the appearance of the eye. The lens was mostly opaque, the shape of an incomplete ring or horseshoe; faint fundus reflex through a membrane showing within the arms of the "horseshoe." The outer margin of the ring was fairly transparent. It resembled the re-formed ring of lens substance, seen in the eyes of the lower animals after removal of the crystalline in early life.

Discussion.—Dr. Walker noted that the dislocation was inward as well as forward. He had never seen regeneration in a human opaque lens.

Dr. Bane considered it remarkable that there should be nutrition of a dislocated lens, still more so regeneration.

Motor Oculi Paralysis.

Dr. H. R. Stilwill showed a man of thirty-five who had suffered from divergent squint of the right eye for ten years, with ptosis of the right upper lid and bilateral mydriasis for the past five years. He contracted malaria five years ago. Two operations for the strabismus had been fruitless. The patient denied syphilis, although he admitted having had both gonorrhea and venereal "warts" at the same time (1893). He had been under "mixed treatment" for the past four weeks, without appreciable effect on the ocular conditions mentioned.

Discussion.—Drs. Walker and Bane diagnosed paralysis due to involvement of the third nerve. Dr. Walker said that advancement of the internus as well as tenotomy of the externus was necessary in these cases; and he thought syphilis, not malaria, was the etiologic factor in this case.

Dr. Strader thought gonorrhea and syphilis had been associated.

Drs. Jackson and Coover believed there was a central syphilitic lesion.

Dr. Neeper related the case history of a patient who developed an induration on the penis one month after exposure, with iritis following. The Wassermann test was positive. Under mild antisyphilitic treatment recovery took place.

Dr. Libby referred to a woman of thirty-seven, very recently examined, who had a complete monocular ptosis of three months' duration and divergent squint of one month's standing, with vision of 5/12. Syphilis was thought to be the probable cause. The ptosis disappeared under three weeks' specific treatment.

Epithelioma of the Lid.

Dr. Walker presented an adult of middle life from whose upper lid he had removed an epithelioma. A small crescentic piece of cartilage and much skin and subcutaneous tissue was removed. There was very little deformity, and healing was complete, except possibly one point on the lid margin.

Discussion.—Drs. Coover, Jackson and Libby advised use of the X-rays.

Dr. Crisp suggested "scarlet red," stating that a remarkable formation of epithelium followed its use. After its use in epithelioma of the lower lid cicatrization had occurred in a week.

Dr. Hosmer had seen favorable results from the use of X-rays after the excision of epithelioma, and believed their use was good practice.

Embolus of Central Artery.

Dr. Coover showed a young woman who had recently had an obstruction of a nasal branch of the central artery of the retina, preceded for years by transient attacks of blindness in that eye. Twenty-four hours after the obstruction occurred there was seen a sharply defined edema surrounding the blocked vessel. Massage, nitroglycerin and amyl nitrite proved of no help. After the use of the high frequency current daily for ten days vision rose to 6/10. The nasal branch was obliterated, and adjacent vessels were thickened. There was a mitral murmur and a history of chronic appendicitis.

Persistent Pupillary Membrane.

Dr. Libby showed a man of fifty with a band of membrane 1 mm. broad extending horizontally across the left pupil, with two bands (one thread-like) running vertically upwards, all being attached to the anterior surface of the iris. The cornea of this eye was 10 mm. in diameter, while the other measured 11 mm. The right pupil contracted to 2.25 mm., the left to 1.5 mm., in bright daylight. Dilatation of the left pupil was very limited. With correction, R. V. = 5/5 +; L. V. = 5/15. Myopia and moderate astigmatism were present in the right eye, and high astigmatism in the left.

Meeting of March 18, 1911. Dr. F. R. Spencer, in Boulder. Dr. Melville Black, presiding.

Syphilitic Hyalitis.

A woman of twenty-four, with dust-like opacities of the right vitreous, was shown by Dr. Spencer, who desired an expression of opinion as to whether or not "606" was contraindicated. Syphilis had been acquired two years before, and failing vision had been noticed for the past six months in the right eye. While Jaeger 2 was the finest print readable with this eye, yet distant vision was 15/15 with correction. Under Hg. and K. I. the patient was gaining weight.

Discussion.—Dr. Neeper thought there was no contraindication to "606."

Dr. Coover would continue the mixed treatment while improvement continued, but would use "606" if progress was not satisfactory.

Dr. Black spoke of the uncertainty of dosage or permanency of the effect of this new remedy.

Dr. Jackson believed its indication was in acute, severe manifestations of syphilis, threatening early disastrous effects. He related two fatal cases that had come to his knowledge. In Dr. Spencer's patient he considered "606" contraindicated by the history of the case.

Congenital Dislocation of Lenses.

Dr. Spencer also presented a woman, aged 31, with dislocation of both lenses upwards and inwards, and history of poor vision since birth. With lenses correcting the aphakia of the visual zone and moderate astigmatism, V. = 15/30 in each eye. With + 2 spherical added, near V. = Jaeger No. 1. Diplopia was noticed only when the glasses were not worn.

Atrophic Changes in Fundus.

A woman of sixty, with history of gradual failure of sight for fifteen years, now rapidly failing, was shown by Dr. Spencer. R. V. = 2/200; L. V. = 15/50; not improved by lenses. The media were clear. Both disks were very pale, with narrowed vessels. On the outer side of the right disk there was a large, atrophic crescent, and diffuse whitish spots of atrophy were scattered over the temporal half of the retina. Dr. G. H. Cattermole, the family physician, stated that the kidneys were normal, the blood pressure 132, and that the vascular changes were such as were normal to the patient's age. The patient suffered from dyspepsia. The treatment consisted of a well regulated life, strychnia, gr. 1/30 t. i. d., potassium iodid, gr. 5 to 10 t. i. d.

Obstruction of Central Artery.

Dr. Spencer presented a woman, aged 69 years, with history of sudden loss of vision in the left eye on January 5, 1911, during convalescence from influenza. Albuminuria had existed for 25 years. R. V. = 15/15 with correction, L. V. = doubtful light perception. There was left divergent squint of about 10°. The left disk was atrophic, and the retina showed degenerative changes, especially in the macular region.

Discussion.—Dr. Bane considered that the fundus changes were old, atrophic and senile.

Dr. Neeper thought that obstruction of the central artery of the retina had occurred on January 5th.

Dr. Jackson noted contraction and irregularity of the arteries, some being opaque, others white, and diagnosed vascular disease, with obstruction, on the 5th of January.

Dr. Black related the history of a boy of twelve years who had suddenly become blind six days before from obstruction of the central artery. When seen on the second day the retinal edema was marked. Four days later it had disappeared and the eye was blind.

Posterior Polar Cataract.

A woman of twenty-five, who had been under Dr. Spencer's observation for three years, was shown because of posterior polar cataracts of recent development. Up to a year before, the media were clear, and normal vision had been given by glasses for the previous 5½ years. Now the best obtainable vision with lenses was 15/20, and the patient was unable to do stenographic work, as formerly. Dr. Cattermole had found anemia and debility. He regulated the diet, promoted elimination, and gave K. I., 5 to 10 grains t. i. d. Dionin had been used in one per cent solution daily for four months. Dr. Spencer thought the opacities were now thinner.

Discussion.—Dr. Neeper suggested a stronger solution of dionin.

Dr. Libby would add very free water drinking to the treatment outlined.

Dr. Black stated that thiocyanate of soda had been reported as beneficial in some of these cases, by changing the metabolism.

Optic Atrophy.

Dr. Spencer presented a man, aged sixty, with history of rheumatism and gonorrhea, but not of syphilis. Sight had suddenly failed in both eyes five months before. The best obtainable vision was 15/70 in each eye, with correction, and Jaeger No. 9. Both optic disks showed well progressed optic atrophy. High frequency current had been the only treatment, having been used twice a week for six weeks.

Discussion.—Dr. Black would try the intermittent X-ray and related a specific case that was much helped thereby.

Dr. Neeper said there would be help from the intermittent X-ray if the causal factor were removed and the nerve elements were able to respond.

Retinitis Pigmentosa.

A woman of thirty-two, with history of night blindness through life, was shown by Dr. Spencer. The corrected vision was 15/10 partly, each eye. No consanguinity could be traced. The general health was poor, but syphilis had not been proved, though suspected. Pigment was scattered over the fundus in the shape of islands rather than the "bone corpuscle" pigmentation usually observed in this disease. The fields were contracted. Dr. Cattermole stated that this patient had been married fifteen years, had a child twelve years old who showed no syphilitic taint, and no miscarriages had occurred. The woman was anemic, had headaches and chest pains. Her husband suffered from headaches, chest and leg pains, which were relieved by deep injections of mercury.

Discussion.—Dr. Bane said that the absence of retinal epithelium and the form of the pigmentation were atypical of retinitis pigmentosa.

Dr. Black believed that crossed heredity was usually the underlying factor in these cases.

Dr. Neeper advocated carefully taken fields.

Transient Lens Opacity.

Dr. Black reported the penetration of the cornea and capsule by a tack, in a man about fifty years old. An anterior diffuse opacity of the lens resulted. A bad prognosis was given. Dionin in 5 per cent solution was instilled daily for ten-day periods, alternated with ten-day rest periods, for two months, with resulting vision of 20/30, and only a small opacity in the lower nasal quadrant.

Orbital Cellulitis.

Dr. Bane reported intense bilateral cellulitis in a man of 55 years, suffering from advanced Bright's disease. The sloughing skin of the upper lids was incised and the lids sutured together to save the cornea. Salt solution and 20 per cent argyrol were used. The vision of the right eye was saved, but that of the left was lost. Death occurred five months later.

George F. Libby,
Secretary.

OPHTHALMIC SECTION

ST. LOUIS MEDICAL SOCIETY.

Meeting February 1, 1911. Dr. M. H. Post, presiding.

Complete Spontaneous Absorption of the Lens.

Dr. A. E. Ewing reported a *Complete Spontaneous Absorption of the Lens* in a patient 70 years of age; a healthy woman who stated that she had cataract in the left eye fifteen years ago, so advanced that she could not see to read with that eye. Four years ago the eye became very red and painful for about one week. She was treated by her family physician, and since then the eye has given no trouble. Six months ago vision in the right eye failed, and she then discovered she could see very well with the left. The right eye now had a well developed cataract. In the left eye the pupil is clear, iris tremulous, anterior chamber somewhat deeper than normal, with tension slightly plus. The ophthalmoscope and focal light show aphakia, a delicate pupillary membrane, two minute chalky looking particles floating in the anterior portion of the vitreous, and a glaucomatous cupping of the disk two diopters in depth. The only evidence that a lens ever existed is its capsule, no trace of even the nucleus being present, unless the particles in the vitreous be remnants of it.

The field is about one-third the normal area, and vision with + 11.00 sph. ⌢ + 0.50 cyl. axis horizontal, is 20/75. The patient, and also her family, disclaim any operation or injury and there is no evidence of any in the cornea or sclera.

Dr. Ewing thinks there is a possibility that the severe inflammation of four years ago was due to rapid swelling of the lens, which produced a rupture in the capsule admitting the aqueous to the lens substance.

The rarity of the case is attested by the fact that this is the first case of the kind he has had during twenty-eight years of private and clinical practice.

Discussion.—Dr. Adolf Alt said that such cases had been reported before. He was sorry he had not looked further into the literature, but he had had a number of such cases in his own experience.

In most of the cases there was a history of some injury. He mentioned the case of a young engineer who was struck by a piece of iron in an explosion. There was a hole in the iris and a foreign body was made out in the crystalline lens. The lens became opaque and swollen and the iris and lens looked rusty. The patient came to see Dr. Alt from time to time and was expecting to have the lens removed. Before this was done the patient wrote that he had felt something give way in his eye, and that he could see. When Dr. Alt saw him again the lens had been absorbed and the patient had fair vision. Dr. Alt had also operated on a man for the extraction of a minute nucleus which lay in the anterior chamber. He had probably been injured many years before. There was in this case almost total absorption of the lens.

These cases, however, differ from Dr. Ewing's case in which there was apparently no injury. Dr. Alt had seen the case through the kindness of Dr. Ewing and found the eye just as Dr. Ewing had described it.

Dr. Ewing said he had inquired of the patient concerning trauma, and she said the eye had never been injured. Dr. Ewing said he believed it was the result of this trouble four years ago, when there probably had been an acute swelling of the lens with rupture of the anterior capsule.

Dr. John Green, Jr., said he had under observation a little boy of four years, who was shot in the eye by a blunt stick, projected from a spring gun.

Dr. Green had seen the gun and noted that the velocity of the projectile was slight. The tip of the stick, which was 1/4 inch in cross section, struck the eye but did not penetrate the globe. There was a forward dislocation of the lens below. The anterior capsule showed a minute rupture and the lens was swelling and becoming opaque. The clear pupillary space was beginning to show.

Dr. Green suggested that possibly Dr. Ewing's patient had ruptured the capsule by accidentally striking the eye during sleep.

Dr. Alt has also under his care at present a boy who had been shot in the eye by a stick.

The physician, to whom the boy had been taken, had promptly dilated the pupil. The mother brought the boy to the clinic the next day stating that the doctor had ruined her boy's eye, when he had done the correct thing. In this case the nucleus has now fallen, through a large tear in the lens capsule, into the anterior chamber and a total absorption of the lens is to be expected.

Dr. J. Ellis Jennings cited the case-history of a man aged 50 who had been struck on the eye by a lump of coal. The capsule was ruptured and the lens slowly absorbed, the pupil being clear in about three months. Dr. Ewing's case, where there was complete absorption of the lens in a patient aged 70, was very rare indeed. Was there not a possibility of a rupture of the suspensory ligament and a disappearance of the lens to the bottom of the vitreous chamber?

Dr. E. H. Higbee told of a man from Washington, Mo., who worked in a factory where they make corn-cob pipes. He was foreman in the factory and was forty-seven years of age. The boys would take the pipe stems and flip them across the room, and this man was accidentally struck by one of these. He was about 16 feet from the boy. The capsule was ruptured and the lens was entirely absorbed. While this was different from Dr. Ewing's case it shows that absorption of the lens took place in a man of 47.

Dr. Meyer Wiener said that Dr. Wolfner has a patient under observation at the present time who is well up in the seventies and spontaneous absorption of the lens has been going on since he has been under observation. He came to be operated on for cataract and they refused to operate on account of a dacryocystitis. While treating the patient for this condition, a black spot occurred in the upper and inner portion of the pupil which is getting larger, and he is now able to count fingers. This is possibly one of those cases where the nucleus is dropping down without any rupture of the capsule, and the lens is becoming softer and being absorbed.

Gun-shot Injury.

Dr. Ewing's second paper reported a case of gun-shot injury of the left globe and orbit, with two shot in the brain. The patient, a boy, first seen by him July 5th, 1910, had been accidentally wounded, nine months previously, by the discharge from a shot-gun some thirty yards distant, and slightly above the patient. There were twenty-three shot wounds in the scalp, nine in the right side of face and ear, and one in the nasal portion of the left upper eyelid. The patient at the time of the injury had fallen, but had not lost consciousness. He was unable to move the right arm and right leg, though speech and the right facial muscles were not affected. There was no vision with the left eye. The patient vomited at short intervals for thirteen hours, and was kept mainly on potassium bromide during the following six weeks by the physician in charge because of excessive nervousness.

The wounds healed promptly except those in the left parietal region, which became inflamed after three weeks, and fever developed, but disappeared with the free discharge of pus from the scalp.

Thirteen days after the injury, the patient began to regain some movement of the hand, and two weeks later could feebly move the leg, though all movements were indefinite, and the patient still walks lame, and has imperfect use of the hand and arm. The lids of the left eye were much swollen and closed within half an hour after the injury, though the eyeball was not red and there was no evidence of its being injured except that there was no vision, and the pupil, as described by the parents, was probably eccentric, or there was blood in the anterior chamber.

After about six months photophobia developed and finally the right eye also became irritable. This induced the parents to consult an oculist. Dr. Ewing found the conjunctiva moderately injected, the left globe filled with blood, but no external evidence of injury except the small scar from the shot-wound in the upper lid, which, from its position, and the general direction of the other shot wounds, made it probable that the globe escaped injury. Advice to have an X-ray examination was rejected.

Two months later the patient returned with photophobia so marked that examination was difficult. X-ray plates were then made, and although no foreign body was shown in the eye, enucleation was proposed but the patient's parents declined. The left eye was still filled with blood, the globe firm, no tenderness, euphthalmine and cocaine, one per cent, kept the patient comfortable in ordinary light. Three months later the blood had cleared from the shallow anterior chamber, the pupil was round, 4-1/2 mm. in diameter, and the lens apparently opaque. The circumcorneal injection of the left eye had increased, and photophobia was very marked in each eye.

Enucleation was submitted to, the operation being done under nitrous oxide gas and oxygen. The frozen globe, bisected, showed a practically obliterated anterior chamber, with the lens dislocated to inner side and total separation of the retina, which was suspended to the inner side between the disk and pupil in an old blood clot which filled the globe.

A point of interest is that a shot passing by the inner side of the sclera and creating no great visible disturbance of the conjunctiva, should so utterly destroy the eye with intraocular hemorrhage to the temporal side, and dislocation of the lens nasalward, as if the concussion had been in the temporal portion of the chorioid, or else that there had been a rapid suction action produced by the bullet passing through the orbit.

It is still more a matter of interest that the photophobia entirely disappeared from the right eye, the same afternoon following the morning of the operation.

The radiographs show one shot in the posterior nasal portion of the left orbit and two shot in the brain, one in the central and one in the posterior parietal region of the left side. Several others are shown deep in the diploe of the right side of the upper portion of the frontal bone. The two shot in the brain must have entered through the left parietal bone, their course being changed to the side of least resistance, which would account for their being so deeply buried in the brain tissue. Or, it may be possible that the shot followed each other through the same skin wound into the left orbit and through one of the left orbital foramina. In this case there would probably have been much greater cerebral disturbance. At the time the radiograph was made, the case was referred to Dr. Hoge.

Dr. Hoge stated that when he saw the case September 17, 1910, the condition was as follows: The cranial nerves were intact, but there was some impairment of motion in both right limbs, probably a little greater in the leg and foot than in the hand and arm. It will be remembered that the restoration of function was first noted in the hand. The paresis was of the spastic type, the tendon reflexes increased, and ankle clonus and Babinski reflex present on right side. The patient's mind was clear and there was no disturbance of speech. No decided sensory changes. A hemiplegia presents the same physical signs whether caused by an injury to the cortex or to the white matter of the brain. Differentiation can be made only by a consideration of other symptoms present, the history of the case, and the distribution of the paralysis. When convulsions occur, especially if frequently repeated, this points strongly toward a cortical lesion. The ordinary type of hemiplegia (non-traumatic) is usually due to softening or to hemorrhage at the internal capsule, and where the lesion is large enough to cause complete hemiplegia, if on the left side of the brain, as in this case, it almost always produces aphasia.

It is possible to have a lesion in the white matter above the internal capsule, not involving the fibers from the motor speech area of the cortex which will cause paralysis of the leg and arm only, but on account of the wide separation of these fibers in this area, it must necessarily be a large lesion, causing therefore considerable shock, probably coma, and such a destruction of fibers that even a moderate recovery of function would not be probable. A meningeal hemorrhage may cause a more or less extensive paralysis of one or more limbs, according to location and extent; may cause complete suspension of function for a time, with complete or approximate restoration of function after its removal by operative interference or by absorption.

In this particular case, a shot severing a meningeal vessel rather high up could have caused a hemorrhage, the clot being thicker over the motor area for the leg, somewhat thinner over that for the upper limb, and not extending down far enough to reach the face and speech centers. Also we would have motion returning first and most completely in the upper limb, as occurred in this case, whereas the reverse would obtain in capsular hemorrhages.

If the shot had penetrated the brain and caused a paralysis by cutting the fibers of the internal capsule to the arm and leg, those to the face muscles could hardly have escaped; and continuing in a straight line it would also have severed at least a portion of the sensory fibers of the capsule.

The same areas would also have been compressed by a hemorrhage to one side of the capsule, if large enough to cause sufficient compression to produce a complete hemiplegia, and in addition we would expect coma.

This analysis of the history and symptoms leads us to believe that we had a meningeal hemorrhage over the motor cortex for the leg and arm, which, being absorbed, has allowed the degree of restoration which at present exists.

If the patient could have been seen at the time of the accident, the indications would have been to turn down a bone flap and remove the clot, thus shortening the time during which the cortex was subjected to compression, insuring a more perfect restoration of function, and lessening the danger of leaving a focus which might favor the development of epilepsy.

Discussion.—Dr. Alt had seen a young man who had tried to commit suicide. He placed the pistol to his temple and the shot had passed through the upper part of the orbit, lodging in the ethmoid cells. The eye itself was not touched by the bullet, but for some reason was taken out by the surgeon. In this case the retina and the chorioid were torn in many places and the eye was filled with blood.

Dr. Green asked Dr. Alt if he did not think that cases of injury from gunshot wounds are apt to fare worse when the shot does not penetrate the globe than when it does. In two recent cases of gunshot injury the eyeball was penetrated, but in both the globe was saved. The reaction from the trauma was surprisingly slight. In Dr. Ewing's case the shot merely grazed the eyeball and yet the damage done was very great.

Dr. Alt replied that sometimes we see very slight results from severe injuries; again we see very grave results from seemingly small injuries. The fact that the shot passed through the eye and caused no great trouble might be explained on the ground that it was aseptic. In regard to shots through the orbit, he had seen a number of cases in which the eye did not show any signs of serious injury, but when the optic nerve had been torn blindness resulted.

In reply to Dr. J. F. Shoemaker's question as to the development of the sympathetic irritation in this case, Dr. Ewing said he did not know. He told of a case that had been operated on for cataract. The other eye was fairly good. The eye which was operated on did not do well in the care of the oculist who had charge of the case, and the patient finally came to St. Louis. The patient could not bear any light upon the well eye. The other globe was tender. There seemed to have been no suppuration but considerable irritis and a general going to pieces of the whole globe. After the removal of the diseased eye by Dr. Post the other eye immediately became quiet and could readily bear the light. It was the same way with this boy. His vision was normal but he could not stand the light. After the removal of the injured eye he could easily stand the light with the other eye, the afternoon following the operation.

Meeting of March 1st. 1911. Dr. M. H. Post, presiding.

Complete Traumatic Aniridia and Cataract.

Dr. John Green, Jr., presented a patient with complete traumatic aniridia and lens injury of the right eye; recovery with useful vision.

The patient, a carpenter, aged 25, while engaged in nailing together a wooden trough, about an hour previous to examination, was struck in the eye by a 16-penny nail, which immediately dropped to the ground. Examination revealed an irregularly "T" shaped perforating wound of the cornea just within the lower inner limbus. The vertical arm of the "T" occupied about the center of the transverse arm, and extended downward just to the sclerocorneal margin. The anterior chamber, which was nearly free from blood, contained no iris tissue save a few shreds at the nasal margin. Ophthalmoscopic examination showed that the lens had been penetrated in the lower third, and that there were a few fine floating shreds in the anterior portion of the vitreous. The fundus details were faintly visible through the upper portion of the lens. The zonula of Zinn was visible throughout the entire lens periphery, except below, where the wound of the cornea made it impossible to get a view of this portion. Tension very much diminished, in fact, the globe was decidedly soft. The vision of the right eye was hand movements at 1½ meters; of the left eye, 5/5 plus. Under local anesthesia the contused edges of the "T" shaped wound were clipped off, the very small quantity of blood was evacuated from the anterior chamber and an occlusive dressing applied.

The following day there was some chemosis below, the wound looked perfectly clean, the anterior chamber was restored, and vision was the same as the preceding day. From this time on, the patient made an absolutely uninterrupted, uncomplicated and painless recovery.

Treatment consisted of saline irrigations and occlusive dressing, with protiodid of mercury, 1/8 grain, internally, three times a day. About six weeks after the injury the lens was found to be quite clear centrally, but there were several peripheral striæ. The vitreous contained a small number of floating shreds.

Spectacles were prescribed as follows: Right eye, a black disk with a 2 mm. circular opening. Left eye, + 1.5 cylinder axis 90°. With this arrangement R. V. = 5/10 + ; L. V. = 5/5 +. The patient wore this arrangement for several weeks and found it a help in the bright light, which was dazzling to the aniridic eye. Recently, however, he has found that the right eye has perfectly adjusted itself to its irisless condition, and he is able to work in the brightest sunshine without discomfort. It is possible that the lenticular opacity may eventually increase, though there has been no sign of any such process during the past four weeks.

Mayou has recently called attention to the fact that the disappearance of the iris after injury may be rather apparent than real. He has found that in such cases the iris is retracted into the angle of the anterior chamber by the organization of fibrous tissue on its surface. If the iris does not disappear until some time after the injury, it is practically certain that it has been drawn back in the manner described. Another cause of apparent aniridia is an incarcerated iris which has been swept into a scleral wound by the escaping aqueous or lens. In severe injuries the iris may be bodily carried away by the sudden expulsion of the aqueous and lens, or rarely, through the forcible expulsion of the aqueous alone, without displacement of the lens. Recovery with preservation of vision is more likely to occur when a complete avulsion of the iris has taken place. If fragments of the iris can be caught in the wound, a subsequent cyclitis is more likely to occur through inflammation spreading into the globe along the track of the incarcerated iris, or an ingrowth of epithelium may give rise to the formation of a fistula. A rare cause of apparent aniridia is retroflexion of the iris, i. e., a doubling back of the iris on the ciliary body. This form is always associated with forward dislocation of the lens. Finally, by reason of the rupture of the pectinate ligament, the ciliary body and iris may be dislocated backward to nearly the equator of the globe, so that the pupillary margin only reaches forward to the corneosclerotic junction. In this type of injury, therefore, the aniridia is only apparent. Dr. Green believes that in the case presented, the roughened point of the 16-penny nail became engaged in the iris tissue, which was forcibly avulsed when the nail dropped out of the eye.

After demonstration of the patient, Dr. Green stated that he was afraid he had not made himself quite clear in regard to penetrating injuries due to magnetizable fragments where the wound of entrance was back of the ciliary body. In his experience, after the magnet operation, the globe can frequently be preserved, but generally without much vision. Dr. Saxl's statement that he removes all contused tissue where that is possible met with his hearty approval. In iris injuries he was in the habit of doing as broad an iridectomy as he could. Infection sometimes occurs from the lacerated margins of the corneal wound, so he has made it a rule to trim away, i. e., bevel, the edges of the wound with sharp curved scissors. In one or two cases he has drawn up a conjunctival flap to cover the corneal wound and with the best results.

He believed the Section should exert its influence with managers of foundries and other shops where the eyes of the workmen were exposed to hazards incident to the manipulation of machinery, to secure the installation of safety appliances. A subsidiary of the Steel Corporation in Worcester, Mass., has a "Department of Safety," which investigates all accidents and works out changes to prevent repetition. For instance, they encase their emery wheel in a steel jacket, which holds the fragments of the emery in case it should burst. A plate glass is interposed between the grinding surface and the workman's eyes to prevent the throwing off of tiny emery fragments. Protective spectacles and a sort of a screen-like arrangement are used by the workmen in performing many of the more hazardous operations of the foundry. Eye injuries from a bursting water glass have been prevented by the adoption of a steel jacket which is placed in front of the glass.

Meeting of April 5th, 1911. Dr. M. H. Post, presiding.

Congenital Cataract.

Dr. C. Loeb presented a patient whom he had seen for the first time ten days ago, when she came to the eye clinic at the Alexian Brothers Hospital, giving a history of having been operated on at the age of 14 for congenital cataract affecting both eyes. The operation was successful in that the patient was afterwards able to read, with proper glasses.

Nine years ago, during a pregnancy, she awoke one morning to find the left eye totally blind, and, one and a half years later, the right eye became suddenly blind. The patient stated that an operation was performed on her left eye one and a half years ago, the nature of which she did not know, but probably an optical iridectomy. The result was bad and the globe is now shrunken. At present the right pupil is dilated with atropine, and the lens capsule, with a small central opening the size of a pin head, is visible. In the fundus can be seen a white mass. No retinal reflex except in the extreme temporal periphery. The patient says she can distinguish light, and there is some slight power of projection.

Dr. Loeb regards the condition as a pseudo-glioma, probably originating as an inflammation of the chorioid and vitreous body.

Dr. Saxl considers this a case of hyalitis, the vision lost through an extensive hemorrhage into the hyaloid body, connective tissue forming subsequently. The decrease in tension is the best proof of shrinkage of the hyaloid. In cases of congenital cataract the vitreous is not very firm; and during pregnancy nephritis frequently leads to hemorrhage, and a severe one must have taken place in this instance.

Dr. Jennings agreed with Dr. Saxl that the condition is probably the result of an extensive hemorrhage.

Dr. Parker asked if there could probably be anything gained from a diagnostic standpoint by doing an iridectomy, thus getting a larger pupil for fundus examination.

Dr. Loeb believed iridectomy in this case hardly justifiable, because of the risk of taking away the slight light perception. The making of a larger pupil by a secondary cataract operation might be feasible. He asked to have an expression of opinion as to whether subconjunctival injections might produce unfavorable results; and in case this mass in the vitreous should not be organized, might any benefit from such treatment be expected.

Dr. Post thought the point well taken as to the avoidance of jeopardizing, by operation, the small amount of vision remaining. He did not favor injections in this instance. As to the iodid treatment, he mentioned a case that came to his clinic some years ago, with proliferation of connective tissue in the vitreous, and he had prescribed iodid of potassium, without much hope of benefit, but the patient had appeared at the clinic from time to time, and claimed that his vision was improving. He disappeared for two years, and on returning, Dr. Post was surprised to find the vision comparatively good. Iodid of potassium had been taken continuously.

Embolism of the Central Artery.

Dr. F. P. Parker presented a case which had been seen by him at Washington University eye clinic the 8th of February, and which he diagnosed embolism of the central artery. Vision at that time was shadow perception at one foot on the temporal side. Ophthalmoscopic examination revealed very small arteries, veins dilated, retina edematous, and a cherry red spot at the fovea. To-day he had found that the red spot had almost entirely disappeared, and the disk had become yellowish white. Pressure and iodid of potassium had been used.

Dr. Jennings thought it a typical case of embolism of the central retinal artery. Treatment to be of any value would have to be instituted before 24 to 36 hours. In a recent case of his own, he had made considerable pressure on the eyeball, and suddenly released the tension in order to drive out the plug. The patient was then sent home and given inhalations of amyl nitrite. The circulation was restored by the next day and the patient ultimately recovered with very good vision.

Unilateral Retinitis Pigmentosa.

Dr. J. Ellis Jennings stated that in a typical case of retinitis pigmentosa the symptoms are so characteristic that a diagnosis is made without difficulty. First of these is night blindness, in which the patient sees quite well in the day time, but very poorly at night. This is accounted for by a marked concentric contraction of the field of vision, which slowly creeps toward the macula region, so that in time the patient, while having fair central vision, is unable to move about alone. When an ophthalmoscopic examination of the fundus is made these subjective symptoms are found to be due to a slowly progressive degeneration of the retina. We find at the periphery of the fundus characteristic patches of black pigment arranged in the form of bone corpuscles or teased out moss. They are found especially along the course of the blood vessels and in places lie on top of them. In course of time the pigmentation slowly advances toward the center. Associated with the pigment changes are atrophy of the retina and optic nerve and very marked contraction of the retinal vessels. The disease affects both eyes, is probably congenital, and often inherited. One-third of the cases occur as a result of the consanguinity of the parents. While the above symptoms describe the ordinary form of the disease, there are typical cases in which all the symptoms mentioned are present except the patches of pigment.

The case I wish to present is unusual in that it has but two or three typical patches of pigment and is further remarkable in that only one eye is involved. Miss S. R., aged 35, consulted me December 10, 1908, on account of fatigue after reading or sewing. She appeared to be in perfect physical condition and had always enjoyed good health. The family history was good and her parents are not related. She has three brothers, all seemingly with normal sight. I examined the eyes of her younger brother and found them normal.

The patient's vision was as follows: Right eye, 5/15, with — 0.75 sph. = 5/9. Left eye, 5/5, with + 0.25 sph. ⊂ + 0.25 cyl. ax. 90° = 5/5. While testing her vision the patient said, "Don't bother with the right eye, the vision has always been poor, in fact, the eye is practically blind unless I look directly at an object." The field of vision was then examined and the right eye was found to be contracted to within 8° of the fixation point, while the field of the left eye was absolutely normal. Ophthalmoscopic examination of the right eye showed that the optic disk was pale and waxy looking, the arteries and veins of the retina were very much contracted and scarcely visible at the periphery. The eye-ground had a washed-out look, and the chorioidal vessels were clearly seen, but no patches or chorioiditis noted. At the extreme periphery could be seen a few small specks of pigment, and on the nasal side two or three of them covered a retinal vessel. The fundus of the left eye was carefully examined, the optic nerve and retinal vessels were normal, no trace of pigmentary degeneration was found. In fact, the eye-ground was perfectly normal.

Discussion.—Dr. Saxl: Cases of retinitis pigmentosa do not seem to be frequent in this country. I have not seen many here, but quite a number on the continent, and I am convinced that the condition has an anemic basis. The retina is not pink, but yellow, and has a washed-out look. I have never seen any other than the bone corpuscle form. In regions where nourishment is very poor, as in Russia during the time of the long fast, and in poor neighborhoods that are frequently inundated, night blindness occurs. I have seen as many as five cases in six months, but without any retinitis. I saw in a family in New York a most pronounced case of retinitis, where father and mother were perfectly healthy, and the living conditions were most favorable. This case of Dr. Jennings is the second I have found under such favorable conditions. Whether syphilis has any connection with it I do not know, but it does not seem so to me.

Dr. Owen: This is quite an uncommon condition, and has always been a most interesting one to me. It is my idea that this process starts from a lesion of the chorioid.

Dr. Loeb: In regard to the rarity of retinitis pigmentosa, I have had two cases in about 250 patients at the Alexian Brothers Hospital, since the clinic started.

Dr. Post: One family in which retinitis pigmentosa occurs has been coming to my office for a number of years. They are well-to-do, well-nourished people. They show no evidence of mal-nutrition. I would like to ask Dr. Jennings if he has come across any reports of cases of monocular retinitis pigmentosa.

Dr. Jennings: I have not been able in the researches I made to find any cases at all similar. This young woman comes from a family in comfortable circumstances, so that she could have everything that would nourish her and keep her in good physical condition. No ear trouble or other ailment, and is a fine specimen of womanhood.

J. G. Calhoun,
Section Editor.

BOOK REVIEW.

Andreas Vesalius, the Reformer of Anatomy.

By James Moores Ball, M. D., St. Louis. Published by the St. Louis Medical Science Press.

This beautiful publication is a monograph, treating of the life, work and struggles of Andreas Vesalius of Brussels, who was born in that city in the year 1514. As the author says in his preface, "Every physician has heard of him, yet few know the details of his life, the circumstances under which his labors were carried out, the extent of those labors, or their far-reaching influence upon the progress of anatomy, physiology and surgery." It is an instructive pleasure and recreation to read the life of this man as told by Dr. Ball in his scholarly manner. Every page is of interest and shows the results of the author's careful and thorough research into a most difficult and almost boundless field.

Dr. Ball unhesitatingly places Andreas Vesalius in the foremost rank of the world's greatest and most famous men, and from the evidence with which his views are supported, it would be difficult to justly deprive him of that honor. He refers to him as "The man who overthrew the authority of Galen; revolutionized the teaching of the structure of the human body; started anatomical, physiological, and surgical investigations in the right channels; first correctly illustrated his dissections, destroyed ancient dogmas, and made many new discoveries—this man, Andreas Vesalius, deserves the name which Morley has given him, the *Luther of Anatomy.*"

We congratulate Dr. Ball and should be indebted to him for taking us on this delightful sojourn into the byways and infrequented vistas of medical history and literature.

The book is profusely illustrated, with reproductions of old plates of a most interesting character.

William T. Shoemaker.

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THE MECHANICS OF CHOKED DISK.*

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Boston, Mass.

The discussion concerning the cause of choked disk has extended over many years without reaching a definite conclusion. Even the question as to whether all cases of choked disk are produced in the same manner is still sub judice.

It is unnecessary before this society to enter into any extended discussion of the various theories. The principal theories which have had earnest advocates are that choked disk is due,

1st. To pressure from fluids in the sheath of the optic nerve.

2nd. Toxemias.

3rd. Intracranial pressure due to fluids or growths.

4th. To retardation of the venous outflow of the blood from the eye.

In a paper published in the *British Medical Journal*, April 8, 1911, Mamaurian and Smith discussed the various theories, and the last one enumerated above they dismissed in the following summary fashion:

"That choked disk is due to the obstruction of the outflow of the venous blood from the optic vein by increased intracranial pressure on the cavernous sinus. But this theory of von Graefe has been disproved by the fact that a free anastomosis occurs between the ophthalmic and facial veins."

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*Read at the meeting of the American Ophthalmological Society, New London, Conn., July 11, 1911.

It so happens that a case has been under my observation for the past few months which has proved that von Graefe's theory cannot be dismissed in any such cavalier fashion. The case is peculiar in that it seldom happens that the pathological condition of the venous circulation is so thoroughly proved in a case in which recovery takes place. The patient was a boy 17 years of age. He had had a mastoid operation done on the 18th of February, 1911, from which he had made a good recovery for five days, when there was a sudden rise of temperature, pulse etc. This continued until the 8th day of March, by which time a diagnosis of probable thrombosis of the lateral sinus was made. About an hour before the operation I was asked to look at his eye to see whether any ophthalmoscopic appearance would serve to confirm the diagnosis. The ophthalmoscope showed the right eye with an entirely normal fundus, and in the left eye, which was on the side of the mastoid operation, the disk was everywhere sharp except a small portion of the circumference down and in, which was slightly blurred, but not more than is often seen where the presence of a choked disk is not suspected. The horizontal veins were markedly, though not excessively tortuous, and the small twigs of all the veins were very markedly tortuous. The fundus was otherwise normal. I gave it as my opinion that the vascular appearance indicated a retardation of the venous outflow.

An operation was done under ether by Dr. George L. Tobey, Jr. "Small cells of the mastoid were found filled with granulations, and the sinus exposed from bulb to upper limits within the mastoid, about two inches. The emissary veins were also exposed. The lateral sinus was covered with a thin white exudate. The incised wall was very thick. A parietal thrombus was demonstrated. Hemorrhage followed the incision of the sinus which was subsequently packed with idoform gauze, and the left internal jugular vein ligated." Following the operation there was considerable rise of temperature and pulse, and the patient, although very ill over several weeks, subsequently entirely recovered.

Ophthalmoscopic examination three days after the operation showed the edge of the disk entirely blurred and all the veins markedly tortuous. In the other eye there was some tortuosity of the larger veins, and the appearance of the smaller twigs was identical with the condition seen in the left eye at the first examination.

On the 7th of April another ophthalmoscopic examination showed in the left eye the edge of the disk still blurred on the nasal side, and while the principal veins and twigs are less tortuous, they are still much convoluted. In the right eye the veins were much straighter, and the edge of the disk was everywhere sharp.

In another ophthalmic examination on May 16th there was hyperemia of the disk in each eye. In the left eye the veins were rather tortuous, although they might be considered within physiological limits. In the right eye the veins were apparently normal.

June 10th the boy was up and about, going out, and ophthalmoscopic examination revealed an absolutely normal fundus in each eye. Vision was 20/XXX-+-4 or 5, without correction of refraction.

The boy was too ill throughout the whole period in which the ophthalmoscopic appearances were present to permit formal fields to be taken, but a rough estimate was made on one occasion in which the only definite fact established was that the field for red was larger than the field for blue.

It will be seen that the first examination of the fundus of the left eye presented the initial appearance of a choked disk. That after the plugging of the lateral sinus and the tying of the jugular vein, a well marked, though not excessive condition of a choked disk supervened, and the early appearances of a choked disk appeared in the second eye.

From the condition found at operation, it would appear to be fair to assume that the retardation of the venous outflow through the diminution of the calibre of the lateral sinus was the direct cause of the tortuosity of the retinal veins as observed by the ophthalmoscope, although the permeability of the sinus was not to any very great extent diminished by the parietal thrombosis. When, however, the outlet for the venous flow was entirely obstructed the typical appearances of choked disk supervened within three days, and apparently these conditions stood in relation to one another as cause and effect.

When a large amount of blood is thrown into new channels a certain amount of time is necessary to reestablish normal flow, and during this period it is interesting to note that not only was typical choked disk produced in the eye on the side of the operation, but the retardation of the outflow from the cranial cavity expressed itself in the tortuosity of the retinal veins in the other eye. This case seems singularly adapted to substantiate von Graefe's theory that an obstruction to the outflow of the venous blood may be the ultimate cause in the production of choked disk. This would seem to favor the theory that intracranial pressure on the venous sinuses causing obstruction to the outflow of the venous blood are the various steps which lead up to the ophthalmoscopic appearance best described by the term choked disk.

6 St. James Avenue.

THE RELATION OF CHOKED DISK TO INTRAOCULAR TENSION.—A CLINICAL STUDY OF SIX CASES.*

WALTER R. PARKER, B. S., M. D.,

DETROIT, MICH.

The cases here presented are from the otological and neurological clinics of the University of Michigan, in the services of Dr. R. Bishop Canfield and Dr. Carl D. Camp.

The tension of the eyes was taken by my assistant, Dr. Alder, with a Schiotz tonometer, at a different time from my examination of the fundi, and entirely independent of it.

An outline of the history of each case is as follows:

CASE 1.—Male, aged 32 years. Developed symptoms of intracranial pressure following an operation for chronic suppurative otitis media. He showed symptoms of cerebral pressure, vertigo, headache and vomiting. Lumbar puncture showed increased pressure. Wassermann negative. V., O.D., 6/7.5; O.S., 6/7.5. Each optic nerve was swollen 5 D. Tension, O.D., 18 mm.; O.S., 17 mm. The fields showed hyperesthesia for red. Postmortem examination showed serous meningitis (streptococcic).

CASE 2.—Male, aged 50 years. Suffered marked symptoms of intracranial pressure. No localizing symptoms. Lumbar puncture showed increased pressure. Wassermann negative. Vision not taken. Field not taken. Each disk swollen 2 D. Tension, O.D., 19 mm.; O.S., 17 mm. Decompression operation. Death. Result of postmortem examination not known.

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*Read at the meeting of the American Ophthalmological Society, New London, Conn., July 12, 1911.

Case 3.—Male, aged 33 years. Developed symptoms of intracranial pressure after having been struck on the head by a baseball. There were no localizing symptoms. Slight labyrinthine irritability, otherwise ear and sinuses negative. Wassermann negative. Blood pressure, 115 mm. V., O.D., 6/9; O.S., 6/12. The edema appeared first in the right nerve which showed a swelling 6 D. The left 5 or 6 D. Tension, O.D., 15 mm.; O.S., 19 mm. Lumbar puncture showed increased pressure. Field showed marked contraction of form fields with interlacing of the colors.

Case 4.—Male, aged 60 years. History of having been struck on the head with a piece of wood. No localizing symptoms. V., O.D., 6/6; O.S., 6/6. The left optic nerve was swollen 2 D. Right normal. Tension, O.D., 25 mm.; O.S., 15 mm. Lumbar puncture not made. Blood pressure 120. Sinuses negative. Some contraction of form fields with interlacing of colors, due to hyperesthesia for red.

Case 5.—Male, aged 17. Showed symptoms of brain tumor, vertigo, headache, and vomiting. Spinal puncture showed marked increased pressure. Blood pressure, 125 mm. V., O.D., 6/20; O.S., 6/20. Each nerve was swollen 5 D. The left developing first. Tension, O.D., 25 mm.; O.S., 12 mm. A diagnosis of brain tumor situated in right frontal lobe was made, and the operation of decompression performed. Swelling of nerve disappeared rapidly. Later optic atrophy developed, appearing first in the left nerve.

Case 6.—Male, aged 23. Suffered marked symptoms of increased intracranial pressure, without localizing symptoms. Before entering hospital Wassermann positive. Given "606." No apparent improvement. After entering hospital Wassermann of spinal fluid and blood both negative. Blood pressure 115. mm. V., O.D., 6/20; O.S., 6/10. Nerve swollen, O. D., 4; O.S., 3 D. Tension, O.D., 21 mm.; O.S., 16 mm.

In order to bring out the salient points of the history of these cases, the following table, showing the amount of swelling in each eye, tension of the globe, and the results obtained by the lumbar puncture, is given.

No.	Amount of Swelling	Tension	Lumbar Puncture	Remarks
1	O. D. 5 D. O. S. 5 D.	18 17	Increased	
2	O. D. 2 D. O. S. 2 D.	19 17	Increased	
3	O. D. 6 D. O. S. 5 D.	15 19	Increased	Swelling appeared first in right eye.
4	O. D. N. O. S. 2 D.	25 15	Not taken	
5	O. S. 5 D. O. S. 5 D.	25 12	Increased	Swelling appeared first in left eye.
6	O. D. 4 D. O. S. 3 D.	21 16	Increased	

In Cases 1 and 2 swelling in the nerve in each case was the same in both eyes, it being 5 D, in the first, and 2 D. in the second. The tension in both eyes, in each case, was approximately the same, in the first 18 and 17 mm., and the second 19 and 17 mm.

In Cases 3 and 4 the swelling in the nerve is of a different amount in each case. In each instance the nerve in the eye showing the least amount of tension is swollen most.

In Case 5 the disks are each swollen 5 D., while the tension of the two eyes shows a difference of 13 mm. The swelling, however, appeared first in the left eye, which had the least tension, and in which at the time of examination there was a beginning atrophic process, while in the right eye the process was still active.

In Case 6 the swelling of the right nerve was 4 D., and in the left 3 D., while the tension was 5 mm. less in the eye the nerve of which showed the least swelling. This was the only exception to the rule that the swelling is most in the eye that shows the least tension. As this patient was under observation but a short time, it was impossible to ascertain in which eye the swelling first appeared, the ophthalmoscopic examination showing no marked difference in the appearance of the two nerves.

The use of the tonometer has demonstrated first: Our inability to determine accurately the tension of the globe by the use of the fingers, and, secondly: That there is a marked variation in the normal tension, the exact amount being still undetermined. This variation is not only present in different individuals, but may exist in the eyes of the same individual.

If for any reason whatsoever the intracranial pressure is increased, the fluids in the cranial-spinal cavities and canals will follow the hydrostatic law and exert pressure equally in all directions. Such increased pressure will manifest itself first at the point of least resistance, consequently, when the intracranial pressure overcomes the resistance at the papilla, edema will appear. One element in the resistance offered at the papilla, is the tension of the globe as shown by the tonometer. If the tension in the two eyes is the same, the edema will appear at the same time in each eye, but if the tension of the two eyes be of a different amount, the edema will appear first, other things being equal, in the eye showing the least amount of tension.

As the edema increases, the resistance at the papilla must increase, otherwise the swelling would stop at 7 or 8 D. That the pressure at the papilla does increase is well shown by the atrophy of the optic nerve fibres that follows prolonged pressure from the infiltration. The tension does not increase with increased swelling of the nerves.

While the number of cases here presented is far too small to establish a fact, it would appear that the choked disk in cases of increased intracranial pressure, as shown by clinical symptoms and lumbar puncture, appears first in the globe showing the least tension.

32 Adams Avenue, West.

A REVIEW OF LEAD AMBLYOPIA AND PRESENTATION OF A CASE OF LEFT HOMONYMOUS LATERAL HEMIANOPSIA DUE TO LEAD POISONING.

CARL WILLIAMS, M. D.,

PHILADELPHIA.

Saturnine amblyopia has been recognized for three hundred years. In 1611 a case of total amblyopia in a woman suffering from lead poisoning is mentioned by Smetius[1]. Other cases were also referred to by him. After this time many of the older writers speak of lead amblyopia. In 1839 Tanquerel[2] recorded several such cases and wrote rather extensively on the subject. Although the older writers refer to the colic of the ancients associated with amblyopia, it was not until the last century and especially until the invention of the ophthalmoscope that any definite knowledge of the action of lead upon the visual apparatus was obtained.

This action is extremely rare when the frequency of lead intoxication is considered. Lewin and Gueillery,[3] up to their exhaustive work in 1905, collected but 142 authentic and well marked cases. This number not only included amblyopias but all lesions of the ocular apparatus due to lead poisoning. By a review of these carefully tabulated cases one is struck by the variety of ocular manifestations, their course and results. In some cases the amblyopia came on suddenly, in several hours or less, progressing to complete blindness. Some of these cases recovered as quickly as they were affected, after a few hours or days. Others suffered more or less permanent defects of vision. In still other cases the amblyopia progressed slowly to complete and permanent blindness, or after a time recovery took place with little or no permanent injury.

The ophthalmoscopic signs of the transitory type of amblyopia also varied. In some cases there were no changes in the eye grounds to be seen. In other cases contractions of the vessels, pallor of disks, hyperemia of the disks, and edema of the retina were seen.

In the slowly developing amblyopias there were cases with no ophthalmoscopic signs, and others with marked neuritis, retinitis or optic atrophy.

The visual field phenomena in all these cases where obtained, were those of contraction and scotoma for both color and form fields.

Because of the various types presented by lead toxemia, various writers have attempted to classify the cases into groups. de Schweinitz's classification is as follows:

1. Transient amblyopia, without ophthalmoscopic change, due to anesthetic effect of the lead on the retina and optic nerve (Thomas Oliver), and unlike amaurosis from uremia fundus lesions.
2. Permanent amblyopia, without distinct fundus changes, or, at most, some hyperemia of the nerve-tip and undue filling of the retinal circulation, due to a retrobulbar neuritis, analogous to that occurring under the influence of other toxic agents. This type may terminate in blindness from optic nerve atrophy.
3. Optic neuritis, or neuroretinitis, either specifically due to the lead, or secondary to change in the brain or kidneys.
4. Optic nerve atrophy, either consecutive to a plumbic papillitis or due to the primary effect of the lead on the visual apparatus.
5. Various types of retinitis, often due to lead nephritis, but also primary and appearing in the form of vasculitis and perivasculitis.

Writers have from time to time presented various explanations for the complex and varied actions of lead upon the eye. Most observers now agree that the transitory amblyopia is due to the anesthetic poisoning or to ischemia due to vasomotor spasm.

The more permanent amblyopia is explained by the direct and permanent action of the metal upon the nervous elements of the optic tract and by the sclerotic changes in the blood vessel walls resulting in ischemia or hemorrhage. But so confusing and various are the phenomena presented in the cases studied, that no systematic causative classification from symptoms and ophthalmoscopic findings can well be made.

Pathological examination has shown in some cases cerebral hemorrhage, in others an obliterating endarteritis, thrombosis and embolism. These changes were sometimes in the intima and sometimes hyaline or connective tissue changes in the other layers. Other cases disclose peri and interstitial neuritis and myelitis. The vessel changes may be most manifest in the periphery or in the cortex or higher optic tract. So also may the nervous degeneration be peripheral or otherwise. A large number of cases are of the ordinary retrobular neuritis character.

Among the more unusual manifestations of lead poisoning upon the eye is that of hemianopsia. This seems to be a very rare occurrence. With the case presented by the writer in 1910 but seven cases seem to be found in the literature. Lewin and Guillery[3] in their exhaustive work upon the effect of poisons and drugs upon the eye report five cases—that of Vater in 1832, Westphal in 1888, Hertel in 1890, Elschnig in 1898, and that of Bihler in 1899. Last year Drs. Farr and Posey[4] also reported a case. A review of these cases shows Westphal's case to have been one with failing vision to the nasal half of the right eye, associated with optic neuritis. The left eye contained a cataract and no fundus details could be seen.

Hertel's case was one of left homonymous hemianopsia with contracted arteries and sluggish pupils. He attributed the hemianopsia to a lesion in the posterior part of the internal capsule from a small hemorrhage, or from a general encephalitis, or from ischemia set up by the arterial spasm.

Elschnig's case was one of bitemporal hemianopsia with choked disks. He believed the lesion to be in the chiasm.

In the fifth case of Bihler the form field was lacking on the right half of both eyes, but was partial. There was, however, complete hemiachromatopsia. With this case were associated small pupils and nystagmus. In the fundus were found slight fullness and tortuosity of the vessels only. Bihler explained his case by localized neuritis in the left optic tract.

Farr and Posey's case showed left homonymous hemianopsia. The nerves were pale and the veins full. The pupils were equal and reacted slowly to light. This case was explained by the presence of a small hemorrhage in the occipital lobe.

The seventh case (writer) also demonstrated left homonymous hemianopsia with pallor of the disks, especially on the temporal halves. The pupils reacted normally.

In these cases as in the other ocular manifestations of lead poisoning, one is struck by the variety and confusion of symptoms. No two cases, other than the hemianopsia, present similar pupillary characteristics or fundus findings. Nor is there a common direct etiological factor or a probable pathological theory which would apply to any two of them.

It is also interesting to note that of the seven cases of hemianopsia, two at least recovered in a short time as quickly as they had become affected. Another recovered completely although more slowly. A fourth recovered slowly except for the presence of permanent scotoma and color amblyopia.

A possible if not probable source of error in the diagnosis of saturnine amblyopia as well as in saturnine hemianopsia, lies in the well known relation between lead poisoning and hysteria. Hysteria in these cases is not uncommon and may simulate hemianesthesia and hemianopsia of the transitory type and without definite ophthalmoscopic findings be ascribed either to the poison or to hysteria. Hemianopsia due to hysteria is only a temporary symptom and therefore in the more enduring hemianopsia only the poison could be presented as the causative factor.

The case of lateral hemianopsia seen by the writer occurred in a man, Michael C., who, on April 6th, 1910, presented himself at the eye clinic of the University Hospital complaining of poor vision, blurring both for distance and for reading, and first noticed about two months previously. He gave the following history: 52 years of age, married and has six children, all living and well. Family history as to malignancy, tuberculosis, renal or cardiac disease negative. Has never used tobacco in any form, and alcohol only moderately, and then usually periodically. He used tea and coffee to excess. Denies all venereal history. By occupation for many years he has been a teamster, farm laborer and coal heaver. In September, 1908, he began to work in the lead yards as teamster, but after a few months was transferred to the shops, where he began to be exposed to lead fumes. Five weeks after he began indoor work, the patient became ill and was admitted to the medical wards of the Philadelphia Hospital, where he was treated for lead poisoning, being discharged after one month as cured. He now returned to his position in the lead works, but after two weeks was again taken ill and re-admitted to the Philadelphia Hospital for six months' treatment, or until about the middle of April. An examination of the records of the Philadelphia Hospital discovered him to have been a patient on the service of Dr. Tyson, by whom he was examined and his condition diagnosed as one of lead poisoning. An examination of his urine at this time disclosed no albumen, a few granular casts, and many hyaline casts. The blood showed hemoglobin 80 per cent, white corpuscles 12.600, and basophylic degeneration of the red cells. He was discharged one month later, on August 6, 1909, as cured. He was again admitted into the Philadelphia Hospital one month later, September 3, 1909. He was this time admitted into the insane department, and his condition treated for nearly seven months as one of toxic confusional insanity, due to lead poisoning.

The patient when first seen at the University Eye Dispensary, on March 6, 1910, was observed to have a hesitating gait and to hold his head in a peculiar and stiff manner. His vision was 6/9 in the right eye, 6/12 in the left eye. The extraocular muscles appeared normal, pupils 3 mm., equal and fairly active to light, accommodation and convergence. Fundus examination showed the media clear, disks round, slightly blurred at margins, and pale on the temporal sides. Veins rather dark. Arteries normal. No other gross changes observed.

A re-examination the next day by Dr. de Schweinitz fully demonstrated left homonymous lateral hemianopsia. In neither eye was the fovea centralis involved. Wernicke's test demonstrated normal pupillary reaction. An examination at that time by Dr. Spiller, showed impairment of muscle strength of the arms, more marked on the right side. Tremor of arms and hands. No ataxia. Station good. Knee jerks prompt and equal. Tremor of lips. Occasional hesitation in speech, and utters test sentences poorly.

The definite history elicited, the typical symptoms obtained, the absence of other confusing pathological conditions, and especially the absence of any suggestive signs of hysteria, or other disease of the nervous system (other than fully explained by the toxemia) would seem to warrant the diagnosis of hemianopsia secondary to lead poisoning.

School Lane and Greene Streets.

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PROBABLE CYST OF THE RETINA.*

George S. Derby, M. D.,

Boston, Mass.

The case which I wish to report is, if my diagnosis be correct, interesting because of its comparative rarity. It is well known that cystic spaces in the retina, the result of edema or degeneration of the retina, are often found at the pathological examination of an eye. Iwanoffs cysts occurring just back of the ora serrata are very frequently seen, especially in old age. The occurrence of cysts in retinal detachments of long standing is also not infrequent. They may be numerous and reach a considerable size. Parsons[1] in his *Pathology of the Eye* discusses the subject and gives a number of references, while more recently the paper of Fujita has appeared, in which three cases are reported and a bibliography given.

If cyst formation in the retina be of comparatively frequent occurrence pathologically, why is it so seldom observed with the ophthalmoscope? The answer to this question is probably found in the fact that cyst formation of sufficient size to be recognized clinically usually does not develop until after a separation of the retina has taken place, and in such eyes the media are likely to undergo changes which will make a satisfactory fundus examination difficult if not impossible. As a matter of fact, however, it may be surmised that a careful examination of our cases of retinal detachment, with the question of cyst in mind, may disclose the fact that this lesion is after all not so much of a rarity as now appears. Leber[2] said over thirty years ago, in the first edition of Graefe-Saemisch: "It is possible that some cases which, from the ophthalmoscopic examination, are believed to be detachment, should more rightly be regarded as cystic degeneration."

The number of instances in which retinal cysts have been observed clinically appears to be comparatively few. In the text books of the present day one does not find mention of them under disease of the retina, although in the older works, such as Graefe-Saemisch first edition, de Wecker, Soelberg Wells, etc., allusion is made to cysts of the retina, but from the text it is impossible to ascertain whether the reference is to cysts found in enucleated eyes or in the living.

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*Read at the meeting of the American Ophthalmological Society, New London, Conn., July 11, 1911. Case demonstrated.

Parsons makes the statement that cysts have not infrequently been diagnosed clinically from ophthalmoscopic appearances. If so, many of these cases have not been published. "Clinical observations of retinal cysts have been made by Merkel in the dog and by Eversbusch in an old horse and a calf." (Parsons, *loc. cit.*, p. 625).

The first case the writer has been able to find and the one which rests on the firmest basis, although it was not a true retinal cyst, is that of Panas and Darier[3]. This was a woman whose left eye had been removed ten years previously for an intraocular tumor. For two years she had noticed in the right eye the same difficulties that had appeared previously in the left.

With the ophthalmoscope was found in the lower external part of the retina a rounded mass the size of the optic disk, of grayish-white color and with a reddish spot in the center, made up of small vessels. This mass protruded into the vitreous. The retina appeared separated from the disk to the tumor. The tumor did not increase in size. The case was watched three to four years, and the vision diminished slowly until at the time of publication it was only quantitative perception of light.

The left eye had been removed for probable sarcoma of the chorioid. There was a yellowish globular mass behind the lens covered with retinal vessels.

The pathological examination showed a distended cyst filling the eye, formed anteriorly by the retina and posteriorly by the chorioid. As the clinical appearance in the second eye resembled that in the first, and as the course of the disease was the same, it seems fair to assume that a cyst formation was taking place in that eye also.

In July, 1890, Marcus Gunn[4] exhibited before the Ophthalmological Society of the United Kingdom a little girl with an eye showing congenital microphthalmus. The lymphatics of the conjunctiva were much enlarged and tortuous. With the ophthalmoscope a raised pale patch could be seen in the fundus. The condition of the conjunctiva suggested a similar condition in the retina.

In 1893 in an extensive paper on the Pathology of Intraocular Cysts, Treacher Collins[5] describes a case which had been observed clinically by Tweedy. "From the upper and lower borders of the optic disk was a broad white band, like opaque nerve fibres, which extended circularly around the macula region. The area thus enclosed formed a prominence at the posterior pole of the eye, having a circumference of about five disks' breadth." As a new growth was believed to exist, the eye was excised. Pathologically this prominence was formed by a cyst measuring six mm. laterally. It had developed between the outer and inner nuclear layers of the retina.

J. Tatham Thompson[6] describes a case of retinal separation following a blow on the eye. The separation was extensive. At one point a cyst was seen projecting forward so as to hide a portion of the disk. It was transparent, and a few small retinal vessels ran over its surface. A colored plate accompanies the article.

The case which I take pleasure in showing here to you for your opinion came to my office on the 2nd of last March. Two and one-half years ago the sight of his left eye began to fail, and a few months later the right eye followed suit. Two years ago he was in poor health, and was in the Boston City Hospital two months for what he calls "typhoid pneumonia." Since that time he has not felt very well. He is 40 years of age, a laborer, is married, has one healthy child; denies venereal disease, but says that at one time he used alcohol to slight excess.

Vision right, 2/60; vision left, can distinguish hand movements at six feet.

In the right eye the lower and outer parts of the visual field are present. In the left, the lower and temporal quadrant of the field remains.

Examination shows normal corneæ and anterior chambers, pupils of equal size which react sluggishly to light.

The right eye shows clear lens and numerous large and small floating vitreous opacities. There is a transparent separation of the retina in the whole lower half of field extending up to the disk and well above it on the temporal side. Running forward and downward on the nasal side of the fundus are several whitish bands of tissue. Down low in the separated retina are a number of glistening whitish spots. Running upward and inward from the disk along the vessels is a line of whitish tissue with dark areas of pigmentation which seem to mark a boundary between the separated retina on the temporal side and the normal retina on the nasal side.

The optic disk is whiter than normal, and shows an atrophic excavation. On the temporal side of the disk, and overhanging it, is a rounded prominence of pear shaped outline with the neck of the pear overhanging the disk. This ascends steeply from the disk and is sharply outlined as it is also along its temporal border. The upper and lower borders are not so sharply defined, yet they are distinct from the surrounding separated retina.

Running over the surface of the tumor are a few small tortuous retinal vessels. The apex of the tumor is best seen with a —6 lens. The vessels leaving the disk can be seen well without a glass. The tumor is of a translucent appearance, and gives a greenish reflex on its outer border. In size it is slightly smaller than the disk.

In the outer part of the fundus can be seen part of a rounded globular swelling of considerable size, translucent in appearance, with a greenish reflex where it swells forward from the surrounding separated retina, probably also of a cystic nature.

The left eye shows a triangular opacity of the lens below; the reflex is dull gray, except upward and inward, where a fairly good red reflex may be obtained. There is probably almost total separation of the retina here.

The ophthalmoscopic appearance of the case has not changed to any great extent since he was first seen, except for a probable slight increase in the size of the growth and an increase in the amount of separation upward. The growth is now somewhat larger than the optic disk.

A chorioidal tumor lying beneath the separated retina can not, of course, be ruled out, but the separation is present in both eyes, and the localized protrusion in the right eye certainly appears to be in the separated retina itself and could hardly be produced by a growth pressing forward from behind.

It is interesting to note that in two of the cases I have alluded to, those of Treacher Collins and Tatham Thompson, the situation of the cyst was similar to that in the case reported here. In Thompson's case the cyst projected forward so as to hide a portion of the disk.

7 Hereford Street.

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REPORT OF A CASE OF SYPHILITIC TARSITIS TREATED BY SALVARSAN.*

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PHILADELPHIA.

In tertiary syphilitic disease of the eyelids, the tarsus is especially liable to be involved, the affection, according to v. Michel, Fuchs and others, occurring either as a diffuse gummatous infiltration with more or less well marked inflammatory symptoms, or more commonly as a circumscribed non-inflammatory gummatous formation.

The latter condition is characterized by single or multiple nodular swellings of cartilaginous hardness, the nodules varying in size from that of a pea to a small pigeon's egg. The skin and conjunctiva may be but slightly affected and palpation shows that the enlargement is confined solely to the tarsus. The lid is everted with difficulty. Occasionally these gummatous nodules break down and ulcerate. The formation of conjunctival cicatrices and malpositions of the lid or a necrosis of the lid may ensue as in cases narrated by Hartridge and Coover.

While the chronic forms of lid syphilis usually appear in the later tertiary stages of the disease, the diffuse, gummatous infiltration occurs sooner, resulting in a diffuse enlargement of the lid with the classical symptoms of inflammation in the foreground. The skin of the lid appears tense and reddened, but yet is freely movable over the tarsus. The enlargement of the tarsus is uniform excepting at the margins where the swelling is more pronounced. Palpation of the tarsus reveals little or no change in density. The conjunctiva may present nothing abnormal, or there may be hyperemia, subconjunctival hemorrhages or superficial ulcerations which often involve the lid margin, sometimes with subsequent temporary or permanent loss of cilia in these localities.

Not infrequently the diseased tarsus may show through the conjunctiva as a lardaceous mass, or be visible only in certain portions as so many greyish white infiltrations. Similar changes at times complicate the noninflammatory varieties of the affection. The preauricular and the glands at the angle of the jaw are often enlarged.

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*Read before the Section on Ophthalmology, College of Physicians, Philadelphia, April 20, 1911.

Tertiary affections of the tarsal tissue have been frequently mistaken for chalazia, especially in cases with few signs of inflammation or without manifest syphilitic lesions. However, the negative results obtained from incising such structures (incisions into tarsal gummata it is claimed do not bleed), the prolonged duration of the affection over several months or more, and the tendency to relapse point strongly to a syphilitic etiology. In quite a few of the reported cases in which no specific history was obtainable, the diagnosis was based upon the results of the therapeutic test. With the Wassermann test now at our disposal the diagnosis ought to be made more readily.

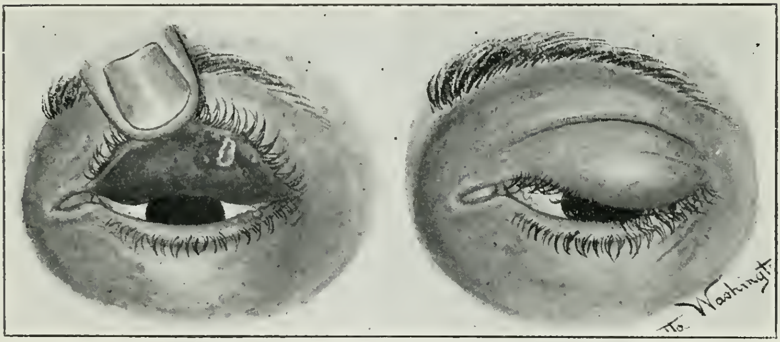
While primary lesions of the eyelids are rare, they still occur oftener than tertiary lesions. In the literature prior to 1899 Hermann was able to collect but twenty cases of syphilitic tarsitis. Since then about ten more cases have been reported. Acquired syphilis is much more often the cause than inherited disease.

From a study of recorded cases and from personal observations, J. Hutchinson, Jr., arrived at the following conclusions:

1. Late secondary and tertiary affections of the eyelids are met with most commonly in those who have suffered severely from their disease, especially those who have had rupial or tuberculous skin eruptions or ulcers of the palate.
2. The upper lid is more liable than the lower one to be affected, though both are not infrequently involved.
3. The tertiary ulceration (gummatous) of the lids is more often met with in women than in men.
4. Not only do many cases of the latter resist specific treatment to a marked degree, but they show a strong tendency to relapse after being apparently cured.
5. As a rule syphilitic ulcers and gummata of the eyelids are more painful than those met with in other parts of the skin, partly due to the very free innervation of the eyelids and partly to their constant motion.

The case about to be described, for the privilege of reporting which I am under obligations to my chief, Dr. William T. Shoemaker, is of interest because of the early occurrence of lid symptoms, the first notes in the eye record being made ten weeks after the appearance of the initial lesion; and furthermore because of the immediate rapid improvement which followed an intravenous injection of salvarsan.

The history of the case is as follows: J. S., colored, aged 26 years, occupation bell-boy, was referred on November 2, 1910, from the surgical dispensary of the Pennsylvania Hospital (service of Dr. Hodge) to the skin dispensary (service of Dr. Chas. N. Davis) for treatment of a secondary syphilide which had shown itself about five weeks after the appearance of a sore on the glans penis. The eruption was of one week duration and consisted of small acuminate papules scattered over the face and trunk. The patient, who had been taking mercury by the mouth, was now put on inunctions of mercury one dram daily.



Left Upper Lid February 21st.

In spite of faithful adherence to the treatment prescribed, the eruption persisted and other lesions followed in quick succession, in short a malignant form of syphilis ensued, the most striking feature of which was the curious inflammation involving the eyelids.

On December 1, one month after the patient's first visit to the skin dispensary, he was referred to the eye dispensary, service of Dr. Shoemaker, for treatment of a nodular tumor formation in the left lower lid about the size of a small pea, and in appearance resembling a chalazion and so tentatively diagnosed. Otherwise the anterior ocular parts appeared normal. The fundus examination was negative, and vision was 6/6 in each eye. An incision was made into the tumor, which was followed by some bleeding but by no evacuation of pus or fluid secretion. An eye lotion and ointment were prescribed and four weeks later the swelling had disappeared. At this time the skin lesions were still pronounced and complicated with an acute inguinal adenitis.

On February 2 the patient returned with a slight diffuse swelling and redness of the left upper lid; the skin was movable over the tarsus, which seemed thickened but could not be definitely outlined. There was slight pain and localized tenderness. On everting the lid several shallow ulcerations $\frac{1}{2}$ mm. in diameter were seen on the outer tarsal conjunctiva interspersed among a few greyish-white subconjunctival striæ which probably represented infiltrated Meibomian ducts. The bulbar and tarsal conjunctiva of both upper and lower lids was moderately injected with associated slight mucopurulent discharge. The left preauricular glands were much enlarged, the same condition, according to the patient, having existed on the opposite side one week previously. The eruption on the face was somewhat less marked.

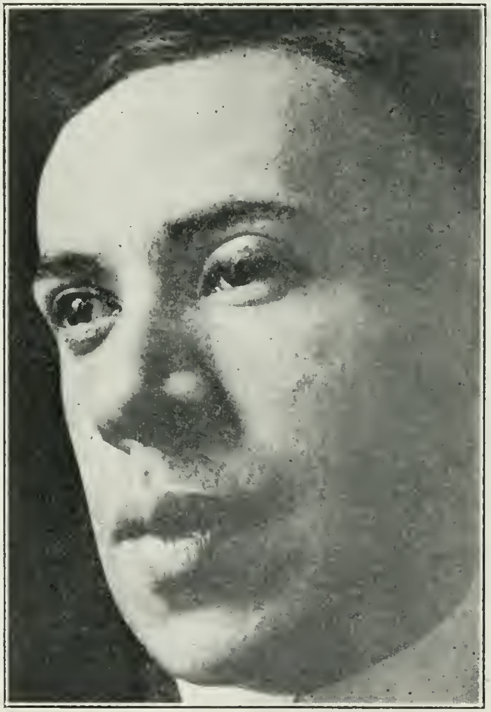
During the next few weeks fresh ulcerations and infiltrations formed on the tarsal conjunctiva, the infiltrations now assuming a more circular shape, the diameter averaging $\frac{1}{2}$ mm. The largest ulcer measured about 2x3 mm. and was situated close to the lid margin about 1 cm. from the external canthus. In addition to the antiseptic washes previously prescribed, a calomel dusting powder was now ordered. General treatment with mercurial inunctions was continued.

On March 2 the right lower lid showed a localized nodular swelling with slight induration. There was slight reddening of the overlying skin, the opposing tarsal conjunctival surface appearing as a greyish red patch about 3 mm. in diameter, not sharply circumscribed and on a level with the adjacent conjunctiva.

The left upper lid was now considerably more swollen, there was more ptosis and the conjunctival lesions were more pronounced, excepting the marginal ulcer, which seemed to be healing over. Compression of the lid caused a thick, creamy discharge to appear at the openings of the Meibomian ducts.

There was a large swelling in the left parotid region, distinct fluctuation being obtainable in the center of the mass. The overlying skin was reddened. The conjunctival secretion was more profuse and there was more pain and tenderness confined to the lid which in conjunction with the thickened condition of the tarsus made eversion difficult.

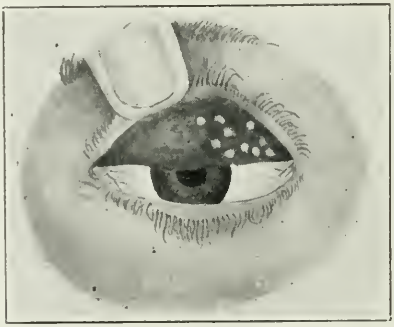
The following two weeks an improvement occurred in the condition of the right lower lid, but the inflammation in the left upper lid persisted with slight changes. On March 7 a more pronounced localized tumefaction of the lid was noted adjoining the site of the marginal ulcer, the appearance simulating a hordeolum. An incision was followed by some bleeding but by no discharge of pus. A positive Wassermann was obtained on March 9.



Photograph Taken March 16th.

On March 16 the right lower lid was again swollen, and two days later still more infiltrated, the infiltration however confining itself to the central portions of the tarsus, resulting in a chalazion-like tumefaction about the size of a large pea, the overlying conjunctiva presenting several pinhead size greyish infiltrations.

The left upper lid was swollen to a thickness ranging from 8 to 10 mm., associated with a ptosis covering the upper third of the cornea. There was induration of the tarsus. The upper tarsal conjunctiva appeared roughened, dark red in color with 7 to 9 lardaceous infiltrations, each one about the size of a pinhead, distributed over the outer half. The marginal ulcer slightly involved the adjoining skin surface; at this point the eyelashes had dropped out. The bulbar conjunctiva was moderately injected and there was considerable mucopurulent secretion. On the whole, however, the condition seemed somewhat better than two days previously.



Left Upper Lid March 18th.

Two days later, on March 20, the patient was admitted to the receiving ward and on the following day an intravenous injection of salvarsan was administered by Dr. W. T. Longcope, following which a very rapid improvement in the general and local symptoms ensued.

Within forty-eight hours the left lid swelling had decreased considerably in size and the conjunctival lesions and the nodular mass in the right lower lid had almost entirely disappeared. At the expiration of one week, the patient was feeling stronger, the papular eruption and the rupial lesions on the extremities were clearing up, a pustular syphilide on the scalp had healed over, and the swelling in front of the left ear was subsiding. The left upper lid was still slightly reddened and swollen, especially at the margin, palpation revealing a thickening and induration of the inferior middle portion of the tarsus. About 1 cm. from the external canthus, the lid margin to the extent of about 5 mm. or more was partially devoid of cilia, the margin and the adjacent skin and conjunctiva appearing roughened and needle-stuck and covered with yellowish furfuraceous scales. Examination of the tarsal conjunctiva disclosed a number of irregularly distributed cicatrices in the marginal zone. There was only slight conjunctival injection.

During the past two or three weeks few changes have occurred, the ocular condition today being about the same as observed a fortnight ago. Cicatrization is more marked, there is possibly less lid swelling and certainly less induration. The Wassermann test was positive ten days ago and another injection is contemplated.*

While the superficial conjunctival lesions may be considered as belonging to the secondary stage of the disease, the thickening of the tarsus and associated infiltration apparently also involving the tarsal glandular tissue, is suggestive of a probable early gummatous infiltration of those structures, an opinion concurred in by Dr. Longcope, who saw the case with me.

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*The following month further improvement in the ocular condition was noted. A second injection of salvarsan was advised, but the patient then stopped coming to the dispensary and has not been heard from since.

EPISCLERITIS PERIODICA FUGAX.*

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Reports of cases of fugacious episcleritis in ophthalmic literature are of such rare occurrence that a detailed report of two cases which have come under my personal observation may be of sufficient interest to be worthy of record.

Probably the first case of this nature was that reported by von Graefe[1] in 1871, under the designation of "subconjunctivitis." This condition was also described by Hutchinson[2] under the designation of "Hot Eye" in his Bowman lecture of 1882, on "The Relation of Certain Eye Diseases to Gout." Three years later Nettleship[3] describes four cases of this nature. In 1895 Professor Fuchs[4] reported his observations and conclusions of a study of twenty-two cases, under the title of "Episcleritis Periodica Fugax." It was his articles which first brought these interesting and peculiar cases to the wider notice of ophthalmologists in general. Professor Fuchs first presented the subject before the ophthalmological section of the British Medical Association in July, 1895, and later in *von Graefe's Archives* there appear the details of twenty-two cases. There have been only a few isolated cases reported since.

The history of my first case is as follows: Mrs. M., 42 years of age, first consulted me May 24, 1909. She has the appearance of enjoying perfect health and takes great pride in stating that she has never had anything the matter with her. She is a well nourished, moderately stout woman weighing 140 pounds, who has not had any severe illness since the exanthemata of childhood, but is of a decidedly tense, neurotic type. She is the mother of two healthy children.

At the time of her first visit the left eye was involved. This had the appearance of an acute inflammation and was limited entirely to the outer quadrant. The conjunctival vessels of this area were distended and the conjunctiva was slightly swollen and edematous, but there was no nodular enlargement. The subconjunctival vessels were distended and congested, as also were the episcleral vessels, giving the sclera the characteristic violaceous color which did not disappear under pressure of the finger. The inflamed quadrant or sector was situated exactly in the region of the tendon of the external rectus muscle and its insertion, and the inflammation was most marked in the sheath of this muscle's tendon and its insertion. The remaining quadrants of the eye retained their normal appearance. Lacrimation and photophobia were present to a moderate degree. The onset of this attack began ten days prior to this visit and was coincident with the beginning of menstruation. She complained of severe neuralgic pain in the eye, and above it in the supraorbital region, where it was most intense. She was unable to read without causing severe pain, and in her own words, "I cannot focus on any object without causing a shooting neuralgic pain." She complained of a dull headache and a feeling of languor. The inflamed area was tender to touch. The cornea was clear and the iris reacted normally to light and to accommodation. With the ophthalmoscope the media were found to be clear and all fundus structures to be normal. Her distant vision without glasses was 20/20 in each eye. Although any attempt to read caused lacrimation and severe exacerbation of the neuralgic pain, she was able to read pearl print from 9 to 13 inches.

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*Read at the meeting of the American Ophthalmological Society, New London, Connecticut, July 11, 1911.

The history of the attacks prior to her first consultation with me, according to her best recollection, is as follows: The first attack occurred in July, 1905, and lasted about five days. They recurred this year in August, September, October, and November, December being free from an attack. In the following year (1906) she was free from the attacks during January and February. Then they recurred during the months of March, April, May, and June; July and August were free from attacks. The attacks occurred each remaining month of this year and recurred each month of the following year (1907), with possibly a single exception. In the year 1908 there was an attack each month, except for two months in the fall. Then recurrences were without exception up to the date of the first consultation.

The patient states that each attack recurred at the beginning of the menstrual epoch, the onset of the inflammation being rather sudden, coming on without prodromal symptoms and reaching its height in the first day. The inflammation invariably remained during the period of menstruation, often subsiding coincident with its termination, but occasionally persisting two or more days after menstruation had ceased. The duration of an attack was usually from five to eight days. In November, 1908, the attack began a week previous to the beginning of menstruation. At this time the patient was under a severe nervous strain, as her husband was in the hospital, and her son had an attack of appendicitis for which an operation seemed imperative. This attack lasted twelve days and was the longest and most severe to this date.

Patient states that during every one of these attacks the eye was painful, the pain being neuralgic in nature; that she was unable to do any close work on account of this pain, and that she had to remain in a darkened room. These attacks have occurred first in one eye, then in the other, without any regularity, and twice they have occurred simultaneously in both eyes. Likewise there was no regularity in the quadrants which were successively involved. However, patient thinks that the left eye has been the one most often afflicted, and usually it has been either the outer or the inner quadrant.

During the year 1908, under the advice of her family physician, she had given careful attention to diet and to hygiene. Although this patient had been unusually rational in her dietetic habits, her physician restricted proteids to the lowest amount, though fish, eggs and milk were taken in moderation. She spent the months of May, June, July, August, September and October in a simple out-of-door life, living at the lakeside in the country.

This patient has now been under my observation for over two years, and I have observed her eyes many times both during her attacks and during the interval between the attacks. As the appearance of each recurrence varies little, I shall not give the detailed case history, but shall summarize the further history of this case as shown by my case records.

Since she came under my care in May, 1909, the attacks recurred during the remainder of this year in the following months: June, September, October, twice in November and again in December. In the year 1910 she had recurrences in February, March, April, May, June, July, August, September, November, and December. In 1911 attacks have occurred in

January, February, March, April, and May. In the year 1910 the severest attacks occurred during June and July and were of nearly two weeks' duration, whereas in the previous year patient was free from attacks in July and August. The attacks of 1911 have been, on an average, of longer duration than those of the previous year, the shortest attack being ten days and the longest three weeks. In January of this year an examination of the urine revealed for the first time some abnormality. There were present albumin and a few casts. The patient was immediately put on a rigid diet and kept in bed for four weeks. At the end of which time the examination of the urine became negative again. During the intervals between the attacks the conjunctiva is normal, except for a slight velvety thickening, and it is also slightly yellowish in color. The sclerotics show no alteration whatsoever. Likewise during these intervals the patient is entirely free from all pain or discomfort, and is able to go about her usual vocation without any annoyance. Menstruation always has been, since its beginning and still is, regular and perfectly physiological. The pelvic organs have been examined by two competent surgeons and both pronounced them absolutely normal.

Case 2.—Mr. B., an office clerk by occupation, 29 years of age, first consulted me June 6th, 1911. He states that he has been having a recurrent inflammation in various parts of one eye or the other, for the past three and one-half years. This inflammation lasts from four to ten days. During the attacks the eye seems "hot," and at times it is so painful that he has been unable to work. Pain is supraorbital, around the eye, and in the eye. On one occasion both eyes were affected at the same time. He states further that the inflammation is usually in different quadrants of the eye with each recurrence. His eyes have not been sensitive to light, but efforts to do near work have often caused such pain as to compel him to give up work for a day or two. He has been entirely free from attacks for three months, but has had four recurrences in a single month. They have usually come on suddenly, reaching their height in a single day, the symptoms being rather severe for two or three days, and then gradually subsiding. One attack, which lasted but two days, terminated suddenly while the patient was under great nervous excitement, for he had been told that his six-year-old daughter had been enticed from home by a strange man.

The appearance of the eye on the day of his first visit to me was as follows: There was an inflamed area confined to the region of the tendon of the right inferior rectus muscle, the conjunctival vessels being distended and congested, and the conjunctiva itself appearing slightly edematous. The superficial scleral vessels were distended and congested, presenting a violaceous color, which did not disappear under pressure of the finger. This area, however, was tender to touch. On looking down he complained of a shooting pain. Strong convergence also produced pain. With a + 0.75 c. in each eye vision was 20/20, and he read pearl print from nine to eighteen inches. The eye was not sensitive to light, there was no lacrimation, no nodular enlargement, and no secretion. The attack began sixteen days previous to this visit, and two days later all inflammatory symptoms had disappeared. June 9th his eyes were perfectly normal, and he was free from any discomfort.

His eyes remained quiet until June 13th, on which date he again consulted me, stating that an attack had begun that morning. I saw him twice on this day and each successive day for several days, and thus had a fine opportunity to watch the development of the local condition. On this occasion the inner quadrant of the right eye was involved. At the beginning of the attack the larger vessels were the first to become dilated, and, studied by means of the loop, they stood out very beautifully and could be seen distinctly lying in several layers. First lay the superficial conjunctival vessels, which were freely movable with the conjunctiva; then beneath these were seen the vessels in the subjacent loose tissue, crossing beneath the superficial ones, and less freely movable than those above. Beneath these, the superficial vessels of the sclerotic were distinctly seen and were immovable. These imparted the bluish tint. A few days later the smaller vessels also became distended, imparting a bright red color to the affected quadrant, and the three layers were not then visible. But after the instillation of a few drops of adrenalin solution (1-1000) the smaller and superficial vessels having been emptied, one again saw the same condition as in the early stage. Adrenalin did not empty the scleral vessels.

Patient was free from pain except when making efforts at convergence. He complained that the eye had a burning, feverish sensation, that there was a sense of fullness in his head, and a sense of somnolence. The latter annoyed him very much.

Patient is a short, fat man, weighing 240 pounds. He has always enjoyed good health, with the exception of an attack of rheumatism nine years past. Prior to this attack of rheumatism he was an excessive meat eater. But since this time, under the advice of his physician, he has taken meat in moderation. However, he is still a hearty eater and partakes of malt liquors daily (one or two glasses). Since January he has kept a diary of attacks, which is as follows: From January 3-9, right eye was inflamed; April 1-2, left eye; April 11-13, right eye; April 15-21, right eye; May 21 to June 9, left eye.

Treatment, Case No. 1.—Prior to her first consultation with me she had been under the care of an ophthalmologist for more than a year. He had made a careful examination of the refraction, and had ordered a low spherocylindrical correction for constant use. A number of therapeutic measures had been tried locally, including heat, cold, atropin, dionin, simple collyria and electricity. Internally salicylates and potassium iodid had been given. Careful attention had been paid to diet and hygiene.

For six months (the summer of 1908) the patient lived a simple life at the lakeside. After coming under my care scrupulous attention was paid to the gastrointestinal tract, moderate exercise was insisted upon, and patient was advised to live as much out of doors as possible. The urine has been repeatedly examined and these examinations have always shown it to be of normal specific gravity, free from casts, albumen and sugar, except in January, 1911, when, as has been stated, a slight trace of albumen was discovered.

Locally I have not been able to find anything which seems to afford relief. Both heat and cold seem to aggravate, and even a 1% yellow oxide salve has a like effect. Dionin also produces a decided exacerbation of symptoms. Atropin, however, which I have been forced to use on several occasions, has afforded considerable relief. She has also found marked relief by taking migraine tablets. These were composed of acetanilid 5 grains and caffein 1/5 grain, of which she takes as many as six a day. This has been done without the advice of her physician. Treatment has apparently been of little avail, as at present her attacks are more severe and of longer duration than formerly.

Case 2 has not been under observation long enough to draw any conclusions in regard to benefit of treatment. Dionin relieved the pain of one attack, and no other local treatment has been used.

The remarkable characteristic of my first case is its persistent recurrence during the menstrual epoch, and the attacks have not occurred at any other time. Several authors have stated that their patients thought that menstruation caused the onset of their attacks of episcleritis, but these authors, for the most part, have expressed a doubt in regard to their relationship. Wyler[5] states: "My patient is prone to believe that her attacks are more frequent and of greater severity during her menses, but the greater excitability at that time may be the explanation. Sufficient grounds for an admission of this kind do not exist." Robinson[6] found that several cases had the beginning of their attacks during the climacteric, and the attacks were also found to be associated with disturbances of menstruation. Professor Fuchs found no connection with the disturbance of menstruation. Rubner, Henrich,[7] in an "Inaugural Dissertation on Further Contribution to the Study of Episcleritis," considering the general subject of episcleritis, mentions menstrual disturbances as having a possible slight influence.

The exact etiology of this class of cases is still unknown, and various etiological factors have been ascribed by different authors. Hutchinson and Nettleship found gout to be apparently the principal factor. Fuchs, in his series, assigned gout, rheumatism, rhinitis, and malaria, the latter being the probable cause of several cases. He states, however, that no definite conclusion can be arrived at as to the cause of this condition. Swan M. Burnett,[8] under the head of "Acute Hyperemia of the Sclera," attributes the attacks to some transitory disturbance of the vasomotor system. Baas[9], in the report of one case occurring in a young man, believes that a nervous origin alone can be assigned as the cause, and explains the local manifestation as a primary neurosis of the conjunctival nerves. E. T. Smith[10] believes that a paragonorrheal condition may have been an exciting factor. Wyler's patient precipitated a severe attack by an indiscretion in diet and excitement.

In my two cases malaria can positively be excluded, as we do not have malaria in Rochester, and they have not lived elsewhere. Reflex disturbances from pelvic disorder may be excluded in the first case, and reflex disturbances from eye strain may also be excluded in both cases. Neither is there clinically in either case anything which would lead one to think that there might be present a rheumatic or gouty element. There was no demonstrable gastrointestinal disorder, and the examination of the urine has always been negative (except as stated in Case 1). However, from a review of all the reported cases one finds no more satisfactory conclusion than that some general metabolic disturbance is the exciting factor in this class of cases. But in addition to this, a factor which is at least contributory to the onset of the attacks is an unstable or perturbed nervous system. In support of this, one finds that many of these patients have been afflicted during the climacteric, that the attacks have been associated with irregular menstruation, and that excitement has been a disturbing element. This latter was noted in both of my cases. In my first case a neurotic disposition was observed as well. The local condition seems to be essentially the result of a local vasomotor dilatation.

It seems to me, then, that the best explanation in this peculiar form of episcleritis is that the local vasomotor disturbance is caused by some irritation which has resulted from a general metabolic disturbance to which a neurotic disposition or a disturbed nervous system is contributory.

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DIVERGENT STRABISMUS WITH DIVERGENCE EXCESS AS ITS ESSENTIAL MUSCULAR ANOMALY.*

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Cases of divergent strabismus may be grouped conveniently under the following headings:

- Paralytic
  - (a) Primary.
  - (b) Secondary to operative procedures.
- Non-paralytic
  - (a) Caused by a convergence insufficiency, and ordinarily accompanied by myopia—the well-known divergent strabismus of Donder's theory.
  - (b) Caused by a divergence excess, the power of convergence being either wholly or in great part preserved, and almost always associated with hypermetropia, either in one eye or in both.

For the purposes of this paper, primary paralytic squint may be disregarded, and it need only be said of the paralytic cases secondary to operative procedures that they have become less frequent of late years than they formerly were, due perhaps to the diminishing frequency of the performance of free tenotomies upon the interni in cases of convergent strabismus. In regard to the divergent squint of myopia, the typical text book example, it may be thought that I am exaggerating when I state that this type, associated with and dependent upon an insufficiency of convergence, is decidedly rare in this city, but I am convinced that, apart from the paralytic cases primary and secondary, the type of divergent strabismus most common in New York, and by no means uncommon, is the type having as its underlying muscular anomaly a divergence excess instead of a convergence insufficiency and, as its underlying refractive error, hypermetropia instead of myopia. It is to this class of cases that I wish to call attention, for the reason that, in so far as the co-existence and interdependence of their muscular and refractive errors are concerned, they have been seldom described, and also for the reason that treatment based upon a correct appreciation of their muscular error is so simple and is so generally followed by excellent results.

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*Read before the Ophthalmological Section, N. Y. Academy of Medicine, May 15, 1911.

In regard to their etiology, I can only suggest that the divergence excess may have been preceded and perhaps caused by a latent vertical error. There is, of course, nothing novel about this suggestion. A latent vertical error has frequently been advanced as the causative factor in various types of strabismus, but my suggestion is based upon the observation of a case of the type under consideration in which a latent vertical error was demonstrated before divergence took place, and which unfortunately was the result of one of my own operations for convergent strabismus. Its history is as follows:

In 1902 I operated upon a well-marked case of convergent strabismus associated with hypermetropia, advancing both externi. Vision was good in both eyes and the result was excellent, binocular fixation and binocular vision being obtained for all distances, with preservation of normal power of convergence and a diverging power equalling a 7° prism. A large latent vertical error amounting to 7°, however, remained, but the general result was so good that the latent error was disregarded. The patient was discharged and was not again seen until a year later, at which time he exhibited a divergent strabismus for distance amounting to 12° and vertical strabismus of 3°. The external rotations were found to be greatly in excess of normal, but the power of convergence was still perfect. Crossed diplopia for distance could readily be induced. In other words, the case had finally become one of the group we are considering—divergent strabismus, associated with hypermetropia, preserving its power of convergence and caused by a divergence excess. We ought, of course, to avoid drawing conclusions from a single case, but we so rarely have the opportunity of learning what the muscular conditions were before an actual deviation took place, that the case may on this account be said to assume a relative importance, and as the latent vertical error was the only muscular anomaly present, it would seem permissible to suggest that it might have exerted a causative influence. Whether or not the latent vertical error existed as a slight vertical deviation before advancement of the externi was performed, I am unable to state, as no attempt was at that time made to demonstrate its presence, and it is of course possible that it may have been produced by the advancement, but, if its causative influence in the ultimate divergence be tentatively admitted, then we may assume that a large latent vertical error, due perhaps to a congenital or early paresis or to a faulty insertion of one of the vertical muscles, may be the primary muscular factor in the production of the cases under consideration.

In regard to the divergence excess, the actual cause of the lateral deviation, it may be objected that its positive demonstration becomes impossible after the deviation has taken place and binocular vision has been abolished. Its existence, however, may safely be assumed from the following facts:

In the first place, convergence is normal or nearly so. That is to say, when the attention of these patients is concentrated upon a near object, both eyes will fixate it, and will continue to do so as it is approached nearer and nearer to the face and, generally speaking, one eye will not diverge until the test object is within three or four inches of the root of the nose. Secondly, the divergent strabismus is constantly present, and is most marked when the gaze is directed towards a distant object. Thirdly, the external rotations are always in excess of normal, often enormously so. In one of my cases they equalled 70°. Obviously, a convergence insufficiency does not exist, and this and the other facts mentioned would seem to indicate conclusively that a divergence excess is the cause of the squint.

As has already been stated, the refractive error in these cases is almost always hypermetropia or hypermetropic astigmatism, at least in one eye, and generally in both, and it seems that the more perfectly the power of convergence is preserved the more certain is hypermetropia to be present in both eyes. I have seen but two cases in which myopia in both eyes was present.

In regard to the treatment of this class of cases, obviously no result is to be expected from the correction of the refractive error. Hyperopic lenses will not cure divergent strabismus and, in the rare cases of this type in which myopia is present, myopic lenses cannot possibly be of service, for the reason that convergence insufficiency does not exist. The proper treatment is operative and, fortunately, the choice of operation is easy and the results are, generally speaking, excellent. It is held by some that the proper treatment of concomitant strabismus consists, primarily at least, in tenotomies of the vertical muscles, and it is even stated that well-marked cases have been cured by this means alone. It is possible that some of the cures claimed may have taken place in the class under consideration but, in these, the lateral deviation is so marked and the difficulty of estimating accurately a slight vertical error in a widely divergent eye is so great, that it would seem more advisable to attack the divergence excess, which has become the causative factor in the end, even if it may not have been in the beginning. To those of us who, following the teachings of Duane, regard cases of strabismus as bilateral anomalies of convergence or divergence, and who in addition attach little importance to the actual amount of deviation present, the proper operation would seem to be a tenotomy of both externi. Obviously advancement of the interni is not indicated, for the reason that convergence insufficiency is not present. In convergent strabismus tenotomies of the interni are, I think, contraindicated on account of the paresis they cause and the ultimate divergence which almost invariably ensues, while in the divergent strabismus of myopia associated with a convergence insufficiency, it is universally recognized that tenotomies of the externi are of no service whatever, but, in the class of cases under consideration, the case is different. Here, on account of the enormous increase in the external rotations, we need have no fear of producing an over effect nor of creating a paresis that will cause these rotations to become subnormal. In convergent strabismus, on the other hand, the internal rotations are but slightly, indeed scarcely at all, in excess of normal and the danger that a tenotomy will reduce them to below the normal amounts almost to a certainty.

In tenotomizing the externi in cases of divergent strabismus associated with divergence excess, the muscles should be freely exposed and divided upon the hook. Subconjunctival tenotomies produce little or no effect. Homonymous diplopia, on looking both to the right and left, is sometimes present for a few days after the performance of the tenotomies. In my cases it has never been permanent.

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ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(UNITED STATES OF AMERICA.)

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Dacryocysto-Rhinostomia (Toti's Operation), With a Review of the Surgical Treatment of Lacrimal Obstruction.

Török, E., New York (*Archives of Ophthalmology*, May 1911), divides the procedures for the correction of this condition into two groups: (1) radical, (2) conservative. The radical methods strive to cure the disease by destroying or removing the lacrimal sac by (a) chemicals, (b) excochleation, (c) destruction by Paquelin or galvanocautery, (d) excision of the sac. He divides the conservative procedures into two main groups: first, the methods which intend to restore the permeability of the nasal duct, and second, those that strive to cure the disease by making a new channel for the tears through the bony wall of the nose. The writer describes Toti's method as follows: After chiselling through the bony fossa sacci lacrimalis, we resect the internal wall of the lacrimal sac, removing at the same time a part of the nasal mucous membrane, which is of approximately the same size as the remaining external wall of the sac. The edges of the two mucous membranes are now brought together. The mucous membrane of the lacrimal sac takes the place of the removed nasal mucous membrane. Both together form now one continuous mucous membrane and with that the closing of the defect is prevented. The writer prefers this method to all others and claims that when properly performed it should result in good and permanent drainage of the tears. H. G. G.

Lymphoid Degeneration of the Conjunctiva. A Nonspecific Theory of Trachoma.

(AUTHOR'S ABSTRACT.)

WANDLESS, HENRY W., New York (*New York Medical Journal*, January 7, 1911). The name "lymphoid degeneration of the conjunctiva" is used because it more properly describes the writer's theory, which is that the disease is noncontagious and nonspecific, these terms being used synonymously in the sense that no specific microorganism or agency is its cause. The author's theory is based upon close observation and experiment through years of clinical study, together with the fact that the investigations for the last fifty years along the line of a specific theory have failed. The conclusion is reached, therefore, that the specific nature of trachoma can be nothing more than assumed. It has been proven that most of the so-called contagious trachomata become acute on account of a superimposed infection of a different nature. The principal lines of thought embodied in the paper are: (1) That trachoma is noncontagious and nonspecific; (2) that trachoma and follicular conjunctivitis are one and the same disease; (3) that pannus must be regarded as reparative; (4) that trachoma is essentially chronic and self limited in its nature; (5) that predisposition and susceptibility are important causative factors; (6) that trachoma may be caused by one or more of a number of agencies; (7) that digestive disturbances, including autointoxication, are potent factors in the cause of trachoma; (8) that errors of refraction deserve careful consideration as contributing causes of trachoma; (9) that adenoids of the nasopharynx and trachoma are similar processes; (10) that heredity, which has been hitherto practically excluded from causation, is undoubtedly an important factor.

Much stress is put upon the contention as to whether folliculosis, follicular conjunctivitis and trachoma are one and the same disease. The author is emphatic in the statement that they are, claiming that folliculosis is trachoma in the first stage; that follicular conjunctivitis (folliculosis plus inflammation) is trachoma in the beginning of the second stage; that they are histologically, pathologically and clinically trachoma, it being impossible to differentiate them as separate diseases.

Pannus is regarded as reparative, and is not thought to be pathognomonic of trachoma, but due to the mechanical injury of the cornea "aided by the milkinglike movement of the lid passing over the blood vessels of the limbus in the act of winking." Pannus aids nutrition and keeps up free circulation, preventing ulceration and destruction of the cornea. This theory of pannus, as regards trachoma, is new. It is pointed out that trachoma is a chronic disease of childhood, beginning in the first years of life, and in its natural course is self limited, running through a three stage course.

Heredity, which has been hitherto ignored, is given a prominent place in causation. Digestive disturbances, errors of refraction, and autointoxication are emphasized as being potent factors in the cause of trachoma, and the author is convinced that predisposition to trachoma occurs in temperaments akin to the lymphatic, strumous, or tuberculous, if they be not exactly the same.

The treatment of trachoma is along the same lines as has been followed for years, but an analysis of the action of the remedies used tends very strongly to disprove the specific theory of trachoma. Experiments have shown that good results were obtained by the use of remedies applied irrespective of their germicidal value. Copper and silver are recommended because of their value in destroying granulating and suppurating processes, while bichloride of mercury, the most powerful of all germicides, acts only as a general antiseptic, keeping the eye free of mixed infections. The prime object in the treatment of trachoma is the complete removal of all the trachomatous tissue, and expression is the most effective method. Scrubbing the conjunctival surface with a coarse brush dipped in a strong solution of mercury bichloride is valuable only because of the mechanical effects of the brush and not because the mercury kills any supposed trachomatous germs. Like many other of the scourges of mankind, trachoma is preventable, and too much stress cannot be laid upon prophylaxis, beginning at birth and continuing through childhood. This includes attention to errors of refraction, sanitation of the eyes themselves, and the general welfare of the body.

Another interesting feature of the paper is the declaration that trachoma and adenoids of the nasopharynx are identical processes for which there must be some underlying pathogenic influence common to both diseases, differing only in some clinical features. So convinced is the author that they are identical, that the points of similarity are summarized at some length.

"Lymphoid tissue wherever found, whether as diffused masses, simple nodules, or as the larger and complex lymph nodes, lymphoid, or adenoid tissue, is composed of two chief constituents—the supporting connective tissue reticulum and the lymphoid cells" (Piersol). 1. Both are histologically the same; 2, both are diseases of childhood; 3, both are self limited, running a three-stage course and ending in atrophy and cicatrization; 4, both are chronic in their nature; 5, both are said to be sometimes congenital; 6, both are more common among the poor in unhygienic surroundings; 7, both are uncommon in the adult; 8, both are more commonly found in lymphatic temperaments and in underfed children suffering from malnutrition; 9, both are rarely observed before the third or fourth year of life; 10, both are more common during the first ten years of life; 11, both are incipient, as a rule, before the fifth year of life, frequently as early as the first year; 12, both are exaggerated by gastrointestinal disturbances; 13, both are exaggerated by functional disturbances of their respective localities; 14, both are favored by predisposition through heredity; 15, both are frequently associated with enlarged tonsils, preauricular and submaxillary glands; 16, both are influenced by climatic changes; 17, both have a tendency to keep within restricted limits; 18, both may exist for years and actually recover undiscovered; 19, both lack a tendency to replace any of the tissue removed; 20, both yield the best results if operated upon in the latter part of the first, or the first part of the second stage; 21, both will continue to progress if operated on too early, as a rule; 22, both are likely to result in permanent damage if allowed to run their full course, or if operated upon too late; 23, children having trachoma usually have adenoids of the nasopharynx. It would appear, therefore, from the preceding, that if trachoma is specific and contagious, adenoids of the pharynx are also.

On a Case of Elastoma of the Bulbar Conjunctiva.

ALT, ADOLF, St. Louis (*American Journal of Ophthalmology,* July, 1911) reports a case of slowly growing, whitish tumor, 5 mm. long by 1½ mm. wide, to the temporal side of the cornea in the conjunctiva of the eye of a woman 46 years old. Epithelioma was suspected, but after it was removed it proved to be simply an elastoma. It was composed of a fibrous tissue covered with a somewhat thickened conjunctival epithelium. On staining with orcein the fibres were found to be elastic.

M. L. F.

Treatment of Purulent Ophthalmia and Simple Means for Its Prevention in Infants.

STEVENSON, MARK D., Akron, Ohio (*Journal of the American Medical Association,* July 8, 1911), does not believe that the gonococcus, unless extremely virulent, can successfully attack normal corneal epithelium, and that therefore the latter should be carefully protected against injury. Treatment should be guided by four considerations: careful, but thorough use of antiseptics strong enough to destroy or inhibit the growth of infectious bacteria, but not too irritating; watchful care over corneal and general nutrition; free drainage; avoidance of the slightest injury to the corneal epithelium. A bacteriologic examination of the discharge as early as possible is of much service in determining the treatment. He uses a 1% solution of silver nitrate usually, in virulent cases 2%, in mild cases 0.5%. If the Klebs-Loeffler bacillus is found antitoxin should be administered; if the diplobacillus, weak solutions of zinc sulphate are instilled. He finds protargol and argyrol comparatively inefficient. The details of treatment and of prophylaxis in infants are given in full, and the writer comes out strongly in favor of the routine employment of silver by physicians in cases of labor, quoting from certain statistics to show that a very large proportion of the cases of ophthalmia neonatorum occur in the practice of physicians and have not been attended by midwives. M. L. F.

The Reporting of Gonorrhœa as a Method for Preventing Gonorrhœal Ophthalmia.

Howe, Lucien, Buffalo, N. Y. (*New York State Journal of Medicine*, July, 1911), urges that *the* method for preventing gonorrhœal ophthalmia is to prevent gonorrhœa itself. This he thinks may be done by reporting gonorrhœa to the Board of Health the same as other contagious diseases. It hardly needs demonstration that gonorrhœa should be restricted, or prevented, but the practical applicability of such a law as the one formulated by the writer may be said to be not yet demonstrated. The advantages which would accrue from such a measure as the one proposed are given as:

First, the mere agitation of such a measure would be educational in showing why men would be reported, and why good women should be protected. Second, if such a law were passed the natural aversion of even semirespectable men to having their names appear in such public records would act as a strong deterrent in saving them and others from disease. Third, such records would be a source of safety to two of the classes of innocent women. These are—

(a) Women contemplating matrimony. The relatives of the intended bride would quite naturally ask the family physician what he thought of the alliance, just as they would ask a lawyer concerning the title of a piece of property in an intended purchase. The physician would then consult these records of the health officer. If he gave an adverse opinion the wedding would be deferred until the prospective groom had had time to recover. That might mean one less case of gonorrhœal ophthalmia or possible blindness, or of inherited syphilis.

(b) Women already married would profit by such records. If the husband's name were on such records, the family physician, even though a stranger, could give to that husband wise and friendly counsel—occasionally could save that woman suffering, or operation dangerous to life. Or, at critical times, perhaps by judicious separating, the pair could save another child from being born with gonorrhœal ophthalmia, possible blindness, or inherited syphilis.

Such a law could hardly fail to lessen to a very decided degree the percentage of children with gonorrhœal ophthalmia and blindness, and the number of those prone to interstitial keratitis, chorioiditis and diseases of the optic nerve.

M. L. F.

The Healing of Iridectomy Wounds and Its Influence on Glaucoma.

Alt, Adolf, St. Louis, Mo. (*Journal American Medical Association*, July 8, 1911), reports the results of a large number of experiments he has made, with a view to elucidating the question of the manner in which influence is exerted on a glaucoma by an iridectomy, in an article accompanied by eighteen illustrations. The results attained lead him back to the explanation offered by v. Graefe, that, instead of opening up new filtration ways, the iridectomy reduces the secretion of fluids in the eye, or alters their composition. M. L. F.

Tuberculous Cyclitis Following Nonperforating Injury to the Eye.

Dodd, Oscar, and Lane, Francis, Chicago, Ill. (*Journal American Medical Association,* July 22, 1911), report a case in which the retina in the region of the ora serrata was ruptured in a boy 10 years old as the result of a contusion of the eye with a baseball. Some months later there was a white, nonvascular mass in front of the retina low in the fundus, through which light could be passed with the transilluminator. There was no detachment of the retina. The cornea had a triangular opacity involving its lower third and extending up over the pupil. Thorough tuberculin tests were negative. Several months later the eye was greatly irritated, the lower part of the lens becoming opaque and the iris was pushed forward. An intraocular tumor was suspected and the eye removed. The anatomic findings are given in detail by Dr. Lane. Briefly they consisted of: Rupture of the retina following trauma, with a chronic plastic iridocyclitis limited to the lower part and consisting of two stages: (1) An old affection resulting in the formation of cicatricial tissue. (2) A recent affection of the ciliary body which had spread out in all directions, invading the iris and episcleral tissue, evidently along the perforating vessels and characterized by the formation of nodules of round, epitheloid and giant cells with central degeneration —a formation which can be considered miliary tuberculosis.

M. L. F.

On the Necessity for Extra Care in the Prognosis and Treatment of Diabetic Cataract.

Gifford, H., Omaha, Neb. (*Ophthalmic Record*), refers to the difference between real diabetic cataract and the cataract which occurs in many old people with diabetes. In his opinion, the chances of a good result from operation in cases of diabetic cataract are not as good as in other cataract patients. He calls attention to the great importance of recognizing the cause of cataract before giving the prognosis, and cites a case of his own in illustration of this. In conclusion he says that the danger of a bad result from operation for diabetic cataract is much greater than in ordinary cataract, and that the patient's life is to some extent endangered, and that even when a good result is obtained in one eye the other should not be operated on.

O. W.

Early Changes Occasioned by the Invasion of the Eye by the Cysticercus.

Cirincione (*Archives of Ophthalmology*, March, 1911) sets forth in detail a clinical observation based upon a cysticercus which had invaded the eye about thirty-five days before and the vitreous about seventeen days later, with the following conclusions:

1. Cysticercus in the vitreous produces an irritating effect upon the retina and optic nerve, and gives rise to a preretinal cellular membrane, which is firmly attached to the retina at only a few points: upon this membrane and the small-celled infiltration, depends the cloudy appearance of the retina and disk.

2. The contraction of the preretinal membrane causes a contraction of the inner layers of the retina, and a throwing into folds of the three outer layers, and this causes the wavy appearance of the fundus, and starts the retinal detachment.

3. Cysticercus of the vitreous can be located beneath the hyaloid membrane, in which case there exists, between it and the parasite, a space which is filled in by that lemon yellow

fluid which flows out during extraction of the cysticercus, and which, when the parasite makes an opening through the retina, as a result of the movements of its neck, may flow into the subretinal space, and give rise to an extensive detachment of the retina.

4. The small spots which lie in front of the cysticercus (prevesicular spots) depend upon the presence of the subhyaloid cell nests, and the iridescence of the margin of the vesicle is an optical phenomenon.

5. The white retinal patch at the point where the cysticercus forced its way into the vitreous is composed of compact cicatricial tissue, which causes a firm adhesion between the chorioid and the remains of the retina, which is here represented by a few Mueller's fibres.

6. In the region where the parasite is attached to retina, the latter is transformed into a connective tissue membrane, and the cysticercus does not lie in direct contact with it, but through the intermediation of a more or less compact layer of cells and coagulated hyaline substance. Beyond the cysticercus the retina rapidly takes on its normal layers again.

7. Numerous multinuclear bodies are observed on the surface of the preretinal membrane, near and underneath the vesicle. These are pseudogiant cells, which result from hyaline masses, in which nuclei have become entangled, and which take on the form of giant cells, probably as the result of the undulatory movements of the vesicle.

8. The extensive changes found in eyes enucleated late on account of cysticercus are the result of proliferation and change of the chorioid, produced by the cysticercus, which acts like an aseptic foreign body, and not upon its irritative action, which does not affect the chorioid.

9. The extraction of the cysticercus from the vitreous is favorable only when the prevesicular spots are seen, in which case we must be careful to reach the subhyaloid space without opening the hyaloid membrane. H. G. G.

Subhyaloid and Vitreous Hemorrhages.

Woods, Hiram, Baltimore, Md. (*Journal American Medical Association,* July 29, 1911), comes to these conclusions:

"1. In older people, i. e., persons over 50, we usually have signs of arteriosclerosis, and if they are not present, the hemorrhage itself is evidence. Eliminating special causes of vascular changes—syphilis, nephritis, etc.—we have to manage, as best we can, or the internist has to manage, the vascular changes. Along this line, we shall get our best results.

2. In young people, whether there is a single hemorrhage or many, we are probably dealing with some infection or disease capable of producing vascular changes. High blood-pressure throws suspicion on the kidneys, whether or not there are other symptoms of nephritis. Anæmia, menstrual disturbances, etc., are but symptomatic of malnutrition probably due to an infection. This may be tuberculous, or may be of some other kind, brought about through defective metabolism. Its presence and nature is to be determined by rigid laboratory examinations.

3. Even when we can find no cause, and have to resort to the "alterative" treatment, we should bear in mind that the cause has not been determined; that it is usually of a serious nature, and that it is well to give the patient the benefit of doubt with regard to the three causes apparently most apt to be found—tuberculosis, defective metabolism, nephritis."

M. L. F.

The Significance of Retinal Hemorrhage.

Rogers, F. T., Providence, R. I. (*Journal American Medical Association,* July 8, 1911), maintains that all types of hemorrhagic retinitis are of a serious import; that even retinal apoplexy is significant of impending danger, while simple retinitis with hemorrhage has a mortality largely in excess of that commonly ascribed to it. His conclusions are: 1. Three-quarters of all cases of hemorrhagic retinitis either terminate fatally within a few years, or the patients suffer marked impairment of health. 2. The existence of any form of hemorrhagic retinitis is suggestive of present or future disease of either the nervous, or circulatory system. 3. The duration of life in albuminuric retinitis increases with the age of the patient, and the younger the patient the worse the prognosis in point of time.

M. L. F.

Optic Atrophy From Traumatic Asphyxia, With Report of a Case.

Parker, Frank Judson (*Archives of Ophthalmology,* March, 1911), reports the case of a man aged 23 years, who was struck on the left shoulder by the weights of an elevator weighing 16,000 pounds. The elevator was stopped automatically, so he was subject to the pressure only for a fraction of a second. He was brought to the hospital, his face black, with a sharp line of demarcation running around the neck just above the clavicle. He was conscious, had marked dyspnœa, total loss of vision in the right eye, normal vision in left eye, exophthalmus of both eyes, and a great swelling of the conjunctiva, from extravasation of blood beneath. Ophthalmoscopic examination showed in the right eye a white nerve, great engorgement of the veins without tortuosity, slight retinal œdema, no perception of light, sluggish pupillary reaction, tension normal. The left eye, vision normal, retinal œdema, engorgement of the veins, nerve normal. After four weeks, in the right eye there was no perception of light, no pupillary reaction, retina normal, veins enlarged, but much less in size than when first examined, optic nerve atrophic with central cupping. The left eye was normal except for venous engorgement. H. G. G.

A Case of Floating "Loemmering's" Crystalline Mass in the Vitreous With Observations on the Formation of Lenticular Rings After Extraction in the Newborn Animal.

Wessely, K. (*Archives of Ophthalmology*, May, 1911), gives the following description of a patient, 72 years of age, who at the age of five years had been stuck in the eye with a knitting needle, followed by an escape of aqueous. The eye presents a small corneal scar, which does not appear to have been caused by a knitting needle, it being too small; the anterior chamber is deep, the iris tremulous and there is aphakia. The fundus shows the changes of high myopia. In the fluid vitreous, beside a few floating opacities, there is seen in the lower, outer portion, a large ring-shaped mass, of bluish white color, covered with small shiny irregularities of a still more intense white color. It is held in place by a few threads of vitreous only. It floats around rather freely, so that the observer sees it from different sides; making it certain that the hole in the ring is empty and not occupied by a membrane. H. G. G.

A Useful Addition to the Test Chart.

Snydacker, E. F., Chicago (*Archives of Ophthalmology*, March, 1911), reminds us that in the average case where the vision and fundus are normal, the ophthalmologist in his routine office or clinic work usually does not make a perimetric examination of a patient. The end toward which he has striven has been to add to the ordinary test chart, small red, green, and blue squares of such size that every normal eye should be able to differentiate them correctly at the ordinary test distance of six meters, and still so small that where color defects, even though not marked, are present, they could be discovered by means of this test. He has affixed to his test chart four squares as follows: One red square 2½ mm. and one red square 5 mm. in size; one green square 3 mm. in size and another green square 6 mm. in size, the test being made at 6 meters. When a patient cannot see the smaller squares which mark the average color angle according to his tests, he is suspicious of a color defect; when a patient cannot differentiate the larger ones, he is certain that it is a case for careful perimetric examination. It is also a good plan to have four squares rather than two, inasmuch as it eliminates guesswork much more certainly. Where these colored squares are affixed to the test chart, each patient's color angle can be determined by the examiner with no appreciable loss of time. He finds the addition of the blue square to his test chart, though of experimental interest, to be of no practical value. He concludes that we have in small red and green squares, of such sizes as he has indicated, affixed to the ordinary test chart, a valuable and time saving aid in the detection of central color scotoma for red and green. H. G. G.

Comparative Studies Concerning the Influence of the Accommodation on the Ocular Tension in Vertebrates.

Hess, Carl (*Archives of Ophthalmology*, March, 1911), describes his experiment as follows: The enucleated eye freed from the attached muscles is placed on suitably bent needle electrodes, after the canula has been introduced into the anterior chamber or the vitreous and fixed in the desired position; the meniscus in the capillary tube is observed by means of a microscope. Thus it is possible to follow the tension even in eyes of only 4 mm. axial length. In small reptiles the tension in the vitreous was observed; in birds, that in the vitreous was taken in some, that in the anterior chamber in others. In all, there was a quick use of intraocular pressure at the instant of stimulation, which returned rather quickly to normal when the stimulation was discontinued. The fluctuations in tension take place at almost the same time as the accommodative changes, which can be followed simultaneously by a record observer. Likewise in the enucleated eyes of birds every excitation caused an increase of the intraocular pressure. He believes that in the eye under normal conditions of the body the accommodative increase of tension is even greater. At any rate, it can no longer be assumed that the accommodation has no influence on the intraocular tension in the eyes of birds.

H. G. G.

Toxic Paralysis of Accommodation.

Hansell, Howard F., Philadelphia, says that the dilation of the pupil which is so often associated with amblyopia from toxæmia cannot be classified as toxic paralysis of the pupil. It does not depend upon the affection of the peripheral or central nerves, but upon the degree of amblyopia, reaching its maximum when all light perception is lost. Ciliary paralysis does not occur. Owing to the low degree of vision the accommodation cannot be determined without a special instrument. Two cases are reported. In the first, a healthy man, two possible causes were discovered, alcohol poisoning and epilepsy. The probability was in favor of the latter. This patient suffered a sudden loss of reading power. At time of examination the pupils were widely dilated and responded to light. Vision was much blurred. Within a few days he recovered the lost accommodation and the pupils returned to their normal size and reaction. In the second case near vision became indistinct while the patient was at work (designing for stained glass), but the distant vision was not disturbed. Accommodation was abolished, the pupils widely dilated and slightly responsive to light The only history obtainable was that of chronic specific urethritis, gonococci having been frequently found in the urethral discharge. His accommodation has returned slowly and is not yet normal. O. W.

A Series of Studies of Nervous Affections in Relation to the Adjustments of the Eyes.

Stevens, George T., New York (*New York Medical Journal*, May 13 and 20, 1911), deals in this, his sixth study, with the facial expression as influenced by the adjustments of the eyes and as elements in the etiology of certain important nervous disturbances.

As in many other articles by the same writer, the reviewer finds much difficulty in "boiling down" the ideas so that they may be adequately expressed in the limits of an abstract, so after spending some time in the effort he has concluded to simply call attention to these articles as well worth reading and very stimulating to thought. M. L. F.

A Contribution to the Study of Traumatic Exophthalmus.

Birch-Hirschfeld, A., Leipsic, and Meltzer, Wedel (*Archives of Ophthalmology*, March, 1911), describe in detail four cases, all of which show a correspondence as to certain features. In all four the dislocation of the globe followed a severe injury which had involved the orbital margin and produced a fracture of the wall of the orbit. In addition they cite 70 cases which tend to show that there is no uniform pathogenesis, as far as the previously reported cases show. The idea of traumatic enophthalmus embraces various determining causes. It is not easy to define the agency of each factor. It is possible that the X-ray may aid us in detecting a depressed fracture of the orbit which otherwise would escape notice. Having gained, however, a knowledge of the various hypotheses as to the cause of traumatic enophthalmus, new cases should be analyzed from every point of view. More careful observation will probably show that the clinical picture under discussion may be produced by various agencies; and not seldom, perhaps, by the combination of a number of mechanical or nervous factors. H. G. G.

Two Cases of Double Perforation of the Eyeball by Foreign Bodies With Recovery of Perfect Vision.

Friedenwald, Harry, Baltimore, reports the following cases: Case 1. A girl, aged seven, had been struck in the left eye by a scale of an exploded cap. There was a small wound in the upper lid, a small perforating wound in the upper temporal ciliary region, where the foreign body had entered, and a second scleral wound in the upper nasal ciliary region. The foreign body was removed through a small conjunctival incision, and measured 5 mm. by 2 mm. The injured eye was the better one, there being a convergent strabismus of the right eye. Improvement was rapid, no infection. Two weeks later vision in the injured eye was 20/50 and remained so. After a lapse of nearly nine years the injured eye appears perfectly normal except for the iridodialysis.

CASE 2.—A man, aged 21, was shot in the face. One shot had entered the left eyeball and another was seen a few millimeters from the cornea under the conjunctiva on the nasal side. There was a prolapse of the iris at the site of the former wound. Atropia was instilled, and the next day the shot lying under the conjunctiva was removed and the prolapsed iris was excised. The wounds healed without reaction. The excision caused a coloboma of the iris, and there was also an iridodialysis in the lower quadrant. At the final examination vision was almost 16/10, slightly better than in the right eye.

O. W.

Directions for Muscle Exercises.

DUANE, ALEXANDER, New York (*Ophthalmic Record*), recommends a printed form giving full and clear directions for the use of patients who do muscle exercises at home. The form used by the writer is described in detail and must be read to be appreciated. O. W.

Eye Affections and Salvarsan.

MCCUBBIN, J. B., St. Louis, and STUELP, O. (*American Journal of Ophthalmology*, July, 1911), furnish a couple of papers on this subject. The former reports four cases. The first patient, a man 36 years old, infected two years previously, gave a history of iritis in his right eye a year before. Injection of 0.6 gm. of salvarsan was followed by a low grade of iritis in the right eye three weeks later, which subsided in about a month. The second patient had an iritis, which improved rapidly, after an injection of 0.55 of salvarsan. The third had tertiary syphilis with a marked neuroretinitis in each eye. No improvement had appeared in the lesions in the eye up to the time of discharge. The fourth case was one of cerebral syphilis with optic neuritis of both eyes, which improved excellently after an injection of 0.25 gm. of salvarsan.

Stuelp presents an exhaustive analysis of 470 cases taken from literature and his own practice, and finds that luetic eye affections react less promptly to salvarsan than other syphilitic manifestations. In affections of the lids there was prompt success in 100% ; in affections of the conjunctiva, prompt success in 63%, none in 37% ; in affections of the cornea, success in 28%, none in 72% ; in affections of the sclera, success in 80%, none in 20% ; in affections of the uveal tract, success in 63%, none in 37% ; in affections of the retina and optic nerve, success in 58%, none in 42% ; in affections of the muscles, success in 26%, none in 74% ; in affections of the orbit and neuralgias of the fifth nerve, success in 100%. He gives the following practical hints: 1. When first making the solution for an intravenous injection it must be shaken very thoroughly and for a long time in the measuring glass with the glass beads, at least for five minutes, otherwise a thin layer of the preparation, which becomes gelatinous at the first shaking, remains attached to the beads and comes off in shreds and membranes after the soda and salt solutions have been added. Later on these particles no longer become dissolved, and thus the murky fluid is unfit for an intravascular injection. By filtration through sterile filter paper the solution can be made clear, but in this way an indefinite portion of the preparation is removed and an exact dosage is no longer possible. 2. The ordinary Strauss needles are not good for intravenous injections, since if held ever so quietly they must wound the intima of the vein and thus favor thrombus formation. The trocar-like needles of Mirowski are much better, the unpointed tubule of which remains lying in the vein. 3. In order to prevent thrombus formation it is best to introduce at first, as well as after the injection, some pure physiological salt solution ; in this manner one may find out whether the canula lies properly and whether the injection can be made without a hitch before the caustic action of the salvarsan has begun, and finally the wound canal is thus made clean of remnants of salvarsan. 4. To prevent inflammatory infiltration in subcutaneous and intramuscular injections it is best to introduce the sterile canula and to remove the syringe, in order to make sure that the needle has not entered a blood vessel ; then the syringe is filled with the preparation, attached to the needle, and the injection is made very slowly. After this the syringe is removed and filled with some sterile liquid paraffin with which the wound canal is freed from remnants of the preparation retained within it. It seems that the inflammatory infiltration always starts from the burnt wound canal. 5. After an injection of salvarsan the patient should be kept in the hospital at least a week; afterward he should be seen daily for a week. 6. It is best to make the injection in the morning, in order not to overlook any side effects, which otherwise might take place during the night. 7. Ehrlich leaves it to the taste of each individual whether to use salvarsan subcutaneously, intramuscularly, or intravenously, also whether in a watery, or oily solution. The action, even to the side effects, seems to be much the same in any of these ways. M. L. F.

The Action of 606 Upon the Eye.

FLEMMING, Berlin (*Archives of Ophthalmology*, May, 1911), cites as the basis of his report the histories of 180 cases of syphilis of the eye treated in the clinic of Prof. Greeff in which arseno-benzol was administered. In a general way he claims that the injections nearly always resulted in increase in the patient's weight and in improvement of vision. Necrosis of the skin, jaundice, intestinal colic, and other symptoms of arsenical poisoning reported by others were never seen, nor were the brilliant results of the treatment as observed by others ever noted in these cases. In summing up, he states that in 606 we have an effective treatment for syphilitic diseases of the eyes in which a rapid result is essential, or when the cases have failed to respond to mercurial or iodine treatment. It cannot be looked upon, at least in eye diseases, as a panacea for all cases of syphilis which will supplant our present specific therapeutic agents. The ill effects attributed to the treatment by some could not be borne out by this report. Such adverse conditions as were observed were accredited to the lues itself rather than to the new treatment. H. G. G.

Influence of Salvarsan on the Eye.

CRISP, W. H., Denver, Colo. (*Ophthalmic Record*), says, in regard to the use of salvarsan in treatment of ocular disease due to syphilis, that the gain seems to be greater in cases of general syphilis than in ocular lues. In the literature of the latter half of 1910 are found reports of striking successes by the use of salvarsan in treatment of syphilitic iritis, optic neuritis, choked disk, and paresis of the ocular muscles. Some failures in treatment of iritis, optic neuritis, chorioretinitis and muscular paresis were also reported. As to the toxic effects of salvarsan on the eye it would appear that fear of injury to the optic nerve is groundless. Ehrlich has made post-salvarsan ocular disturbances a special study and has come to the conclusion that they are not due to salvarsan, but are manifestations of syphilis, and arise from isolated groups of spirochætes which persist in cranial nerves enclosed in bony canals after the sterilization of the general mass of organisms. On the other hand, Stern and others hold that salvarsan is directly responsible, and a case of Stern's is cited in proof of this. O. W.

Ehrlich-Hata 606 in Ophthalmology.

Schnaudigel, Otto, Frankfort-A.-M., Germany (*Archives of Ophthalmology*, May, 1911), makes a brief report of 21 cases of syphilitic eye affections treated with arseno-benzol injections. In one case of the series the treatment failed. This, he believes, does not offset the others, in which results were uniformly good, and the remarkable therapeutic action of the drug in removing a large papillary swelling of the iris in a week and curing a tarsitis of several months' duration in two days, seems to be convincing, even to the skeptical. H. G. G.

The Ocular Affections in Congenital Syphilis.

Risley, S. D., Philadelphia, says that the study of ocular affections due to syphilis demands a general view of the disease, since the ocular disease is one of the local manifestations of a systemic affection, or a sequel of the resulting dyscrasia. In congenital syphilis the child will show at birth, or soon after, the stuffed nostrils, mucous patches, eruptions, and febrile reaction, these being the characteristic symptoms of the secondary stage of acquired syphilis in adults, and with these are chorioiditis, iridocyclitis and descemetitis. The well-known predilection of the spirillum of syphilis for attacking the ectodermic and mesodermic structures of the body accounts for the frequency with which the eyes are involved in metastatic collections of the micro-organisms. In this connection it should be remembered that the eye is developed embryonically solely from the ectoderm and mesoderm, and that those structures are most liable to invasion. Prenatal iritis rarely occurs, but the writer has had one case in his own practice. Violent iritis in infants is also rare, but ciliary injection, slight posterior synechiæ, deposits on Descemet's membrane, proliferating chorioiditis, and cases of pseudo-glioma are more frequent. Ocular affections in tainted children will present the same group of symptoms which are found in the later stages of acquired syphilis in adults, and in addition to these will also be found arrested development, glandular disease, impaired metabolism, nodes and gummata, interstitial keratitis, imbecility, or impaired mentality, meningitis, optic atrophy and the tabetic phenomena of early life. O. W.

The Influence of Pregnancy on Diseases of the Eye.

Shute, D. Kerfoot, Washington, D. C. (*New York Medical Journal,* June 3, 1911), presents the following conclusions: 1. Albuminuric retinitis may exist for weeks, and even months, without pregnant women complaining of impairment of vision. 2. The retinitis can exist for some time independently of, as well as in association with, symptoms of renal disease; also, independently of, as well as in association with, albuminuria. 3. The presence of this retinal inflammation indicates a far advanced condition of the toxæmia of pregnancy; or of that manifestation of the toxæmia known as the kidney of pregnancy. 4. The presence of this disease, in a larger number of cases than is realized, indicates a very grave prognosis as to the life of the patient, for the kidney of pregnancy may be followed by chronic interstitial nephritis. 5. As long as the albuminuric retinitis lasts there is danger of vision being irretrievably ruined at any moment and in any month. 6. The ophthalmoscope is the only means by which the *earlier* and *relatively* much less serious stages of toxæmic retinal involvement can be detected. Also, it is the only means by which we may know that albuminuric retinitis even exists. 7. Should the earlier stages of retinal involvement be detected, as they can, by the use of the ophthalmoscope, such remedial procedures can be adopted as may prevent the development of so sinister a disease as albuminuric retinitis; and, also the necessity of inducing premature labor, in order to safeguard vision, may be obviated. 8. When uranalyses are negative, the presence of pathological arterial tension and pathological leucocytosis are invaluable symptoms of the toxæmia of pregnancy. If increased arterial tension is persistent, as indicated by an abnormally accentuated second sound of the heart in association with a tense and wiry pulse, or as revealed by the sphygmomanometer, an ophthalmoscopic examination of the eyes ought by all means to be made at stated intervals. 9. It is as much the duty of the obstetrician to be practically familiar with the use of the ophthalmoscope as it is that of the neurologist. 10. If the obstetrician can not use the ophthalmoscope, both his own and his patient's welfare will be promoted by having the cooperation of the ophthalmologist, when there is persistent increased arterial tension, or albuminuria, in a pregnant woman. M. L. F.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(GREAT BRITAIN AND THE ENGLISH COLONIES.)

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The Filtration Angle: The Anatomy and Function of Its Parts, Together With Certain Suggestions Bearing on Their Association With the Production of Glaucoma.

THOMSON, ARTHUR (*The Ophthalmoscope*, July, 1911). The author in a previous paper laid stress on the appearances which indicated that the character of the infiltration angle varied with the condition of the iris, the pectinate ligament being stretched in such a manner as to round off the angle when the pupil was contracted, while, when the pupil was dilated, the same tissue by its resiliency being withdrawn against the outer wall of the angle, emphasized the depth of the sulcus circularis corneæ. In the present article he endeavors to show that there is a structural provision for overcoming the influence of external pressure on the walls of the veins and capillaries, the natural tendency of which would be to collapse, were there no forces other than the influence of pressure alone to bring about the removal of the aqueous humor.

The meridional fibres of the cilary muscle arise from a projecting rim of scleral tissue immediately to the outer side of the iridial angle, the so-called scleral process or spur (calcar scleræ). The oblique base of this process is confluent with the inner surface of the sclera immediately to the outer side of the filtration angle. Its apex points forward and inward towards the outer wall of the iridial angle; to its anterior sloping margin are attached the bundles of the trabecular tissue of the pectinate ligament, formed by the splitting up of Descemet's membrane, while from its posterior edge arise the meridional fibres of the ciliary muscle.

The fact that this process is not drawn out and tapered in the direction of the habitual muscular pull, backward and outwards, suggests that it is not a fixed point, but acts in a lever-like fashion, directed as it is forward and inwards, being drawn backward when the muscle contracts, much as a door would be pulled open.

At the internal sclerocorneal junction, the sulcus circularis corneæ produced by the overhang of the thickened internal circumference of the cornea, Descemet's membrane undergoes a change, breaking up into a number of fibrillæ and forming a triangular area of trabecular tissue, the so-called pectinate ligament, the spaces of which are lined by extension of endothelial cells from the posterior surface of Descemet's membrane.

This field of trabecular tissue intervenes between the denser scleral tissue externally and the outer wall of the iridial angle internally. The summit of this triangular area corresponds to Descemet's membrane at the internal sclerocorneal junction, its base is incised by the summit of the scleral spur, in such a way as that many of its fibres are attached to the anterior and external surface of that process, while internally some of its fibres sweep backwards past the projecting summit of the scleral spur and become continuous with the tissue of the iris lying internal to the meridional fibres of the ciliary muscle, and establishing a connection with the area occupied by the circular fibres of that muscle.

Situated between the dense scleral tissue externally and the trabecular tissue of the pectinate ligament internally is the canal of Schlemm, represented in section as an endothelial-lined cleft, usually empty but occasionally containing a few red blood corpuscles. Elastic tissue enters largely into the composition of the trabecular tissue, but no traces of any of the fibres of the ciliary muscle are found extending forward over the scleral spur to reach the inner wall of Schlemm's canal. The scleral spur is so situated that while the meridional fibres of the ciliary muscle by their contraction can pull the spur backwards and inwards, the elastic tissue attached to its anterior surface will by its resiliency tend to counteract this and pull it forwards and outwards again.

There are three muscles which may exercise an influence on the position of the scleral spur, pulling it backwards and inwards: these are the meridional and circular fibres of the ciliary muscle, and the sphincter muscle of the pupil. The former act in accommodation, and in their action are usually associated with contraction of the pupil. The resultant of the combined action of these muscles is such as to draw the scleral spur backwards, and owing to its lever-like connection with the inner surface of the sclera also inwards, with the consequent result that the fibres of the pectinate ligament which are attached, as has been described, to the anterior surface of the scleral spur are put on the stretch. Further, in consequence of the intimate connection of the fibres of the pectinate ligament with the inner wall of Schlemm's canal, of which, in fact, they form the inner wall, it follows that that wall is forcibly pulled inwards, and the lumen of Schlemm's canal is thereby increased. In this way a negative pressure is established within the canal into which fluids will pass along the line of least resistance. When the muscles aforementioned cease to contract, the pectinate ligament by its inherent elasticity pulls the scleral spur forwards and outwards again, thus mechanically effecting the collapse of it to the ordinary influences of the intraocular pressure.

What takes place is closely analogous to what happens when we pull open a door which is again closed by the elasticity of an india-rubber band.

The induction of a negative pressure within the canal of Schlemm will naturally lead to the accumulation of fluid within it along the channels of least resistance.

A specimen reproduced from a case of retinal hemorrhage exhibits a natural injection of the parts around the iridial angle. The fluid in the anterior chamber contains a large number of blood corpuscles. These have been carried into the recesses of the pectinate ligament, and so onwards into the canal of Schlemm. The same may be seen in the crypts at the chorioidal attachment of the iris, and also in the interspaces between the bundles of the ciliary muscle. The whole of these lymph spaces had become choked with broken-down blood corpuscles and pigment and in consequence blocked, with the result that an attack of acute glaucoma supervened and necessitated the removal of the eye.

The specimen is an admirable illustration of the freedom of communication between these lymph spaces (spaces of Fontana) and the canal of Schlemm, clearly demonstrating that the inner and hinder wall of the canal of Schlemm is in free communication with the interstitial spaces of the pectinate ligament.

These interspaces appear as a series of channels parallel to the inner wall of Schlemm's canal, posteriorly they bend around to enter the posterior edge of the canal, so as to lie within the receding angle formed by the anterior edge of the sclera itself. It follows, therefore, that when the scleral spur is pulled inwards by the action of the ciliary muscle, these channels will be uncurved and somewhat straightened, so as to render more easy the flow of fluid through them, when, however, on the relaxation of the muscular contraction, the scleral spur is pulled forwards again by the elasticity of the pectinate ligament, the angle between it and the sclera proper will become narrower, the small channels will become acutely bent and so blocked, and thus a valve-like action will be induced, which will, under these conditions, prevent any return flow from Schlemm's canal.

As will have been gathered from a consideration of the foregoing observations, any advantage to be gained from the standpoint of a filtration theory must depend upon an alternation in the lowering and raising of the pressure within the canal of Schlemm. As has been suggested, the production of a negative pressure within the canal is due to the ciliary muscle pulling back the scleral spur, and thus indirectly through its connection with the pectinate ligament dragging inwards the inner wall of Schlemm's canal, and so considerably increasing its lumen. This action will be followed by an inflow of fluid into the canal, and since the channels of communication between the canal and the aqueous chamber are probably freer and more open than those between the canal of Schlemm and the surrounding veins, it may be assumed that the inrush of fluid mainly takes place from the aqueous chamber. Equilibrium having been established by the filling of the canal, no further flow is possible so long as the ciliary muscles remain contracted. As soon, however, as they relax, the influence of the elastic fibres of the pectinate ligament will come into play, exercising a gentle pressure of the inner wall of the canal of Schlemm as they pull forward the scleral spur to what we may term the position of rest. The pressure so exercised will assist in the expulsion of the fluid contained in Schlemm's canal onwards through the channels which connect it with the venous circulation, since, as has been proved experimentally, although it is possible to inject Schlemm's canal from the scleral veins, it is not possible to force the injection back from the canal into the anterior chamber. This return flow is checked, as has been explained, by the more abrupt bending or kinking of the connecting channels passing from the interspaces in the pectinate ligament into the hinder part of Schlemm's canal, as they lie in the receding angle between the scleral process and the sclera itself, which angle being narrowed by the return of the scleral process to the position of rest, will naturally lead to a compression of the channels which lie within it.

If these conclusions be granted, it is obvious that the efficiency of this mechanism, apart from other conditions which may give rise to secondary glaucoma, depends on the normal functional activity of two factors, viz.: (1) the ciliary muscle, and (2) the pectinate ligament. Any change which impairs the normal activity of either of these structures will consequently interfere with that alteration in their action which has been insisted on as being necessary to induce these mechanical conditions which will promote filtration through the canal of Schlemm. Thus, atrophy or paresis of the ciliary muscle, or any affection which would lessen its contractile efficiency, would militate against such action as it might bring to bear on the scleral spur, and so indirectly affect its influence upon the inner wall of the canal of Schlemm.

On the other hand, a hypertrophy of the muscle, such as is stated to affect the circular fibres in the hypermetropic eye, may, by its constant and prolonged contraction, overcome the elasticity of the pectinate ligament, and so by keeping the canal of Schlemm permanently dilated, permit the establishment of an equilibrium between the pressure within the aqueous chamber and that within the venous circulation, thereby upsetting the mechanism whereby a negative pressure is from time to time set up within the canal of Schlemm. The importance of these observations will be at once apparent when it is borne in mind that primary glaucoma is essentially a disease of late adult life, and that it occurs much more frequently in hypermetropic eyes.

In like manner, any condition of the pectinate ligament which tends to a loss of its elasticity, will materially affect the mechanism which gently compresses the canal of Schlemm and restores it to the condition of rest, for when once a condition of equilibrium has been established within the canal, the pressure exercised by the elasticity of the tissues composing the pectinate ligament is necessary to empty the canal of its contents, and so permit the muscles once more, by exercise of their combined influence upon it, to establish that condition of negative pressure within the canal which is essential to any such system of filtration. Consequently, the varying degrees of sclerosis of the ligament, so frequently described in association with cases of primary glaucoma, are just such as to destroy its functional activity, and so throw out of gear the mechanism so ingeniously devised by nature; indeed, the breakdown of the mechanism presents a striking analogy to the changes of the vascular system met with in old age, where the enfeebled muscular tissue of the heart, combined with the loss of elasticity in the arterial coats, contributes to the failure of the circulation.

In conclusion the suggestion is made that the early treatment of primary glaucoma should be directed toward restoring the functional activity of the parts concerned, viz., the ciliary muscle and the pectinate ligament. W. R. P.

Color Vision and Color Blindness.—I.

Edridge-Green, F. W. (*Lancet*, February 4, 1911). The author objects to the name color blindness for the condition to which it is applied, and still worse are the terms red blindness and green blindness.

In the majority of cases of color blindness there is no blindness to colors in the ordinary acceptance of the term; a green, red, or yellow light produces a very definite sensation of color. Those who confuse red and green do so, not because they see red as green or green as red, but because both give rise to a similar sensation of color.

The following theory is advanced to explain vision and color vision:

A ray of light impinging on the retina liberates the visual purple from the rods and a photograph is formed. The rods are concerned only with the formation and distribution of the visual purple, not with the conveyance of light impulses to the brain. The ends of the cones are stimulated through the photochemical decomposition of the visual purple by light (very probably through the electricity which is produced), and a visual impulse is set up which is conveyed through the optic nerve fibres to the brain. The character of the stimulus differs according to the wave length of the light causing it. In the impulse itself we have the physiological basis of the sensation of light, and in the quality of the impulse the physiological basis of the sensation of color. The impulse conveyed along the optic nerve to the brain stimulates the visual center, causing a sensation of light, and then passing on to the color-perceiving center causes a sensation of color. But though the impulses vary in character according to the wave length of the light causing them, the retinocerebral apparatus is not able to discriminate between the character of adjacent stimuli, not being sufficiently developed for the purpose. At most seven distinct colors are seen, whilst others see in proportion to the development of their color perceiving centers only six, five, four, three or two. This causes colorblindness, the person seeing only two or three colors instead of the normal six, putting colors together as alike which are seen by the normal sighted to be different. In the degree of color blindness just preceding total only the colors at the extremes of the spectrum are recognized as different, the remainder of the spectrum appearing grey. Though my opinion is that the ordinary form of congenital colorblindness is caused by a defective development of the portion of the brain whose function is the perception of color, we must not exclude any portion of the retinocerebral apparatus, defect of which would have exactly the same result. It will be noticed that the theory really consists of two parts, one concerned with the retina and the other with the whole retinocerebral apparatus.

In support of the foregoing statement evidence along the following lines is given:

1. Anatomical.
2. Physiological analogy with other body cells.
3. The relation between the foveal and the extrafoveal regions.
5. Chemical analogy.
6. Disappearance of lights falling on the fovea.
7. Illusion of moving light.
8. Purple after image.
9. Currents seen in the field of vision not due to the circulation.
10. Pressure figure.
11. Macular star.
12. Entopic appearance of cone mosaic.
13. Visual acuity.

The author regards the visual purple as the "sole visual substance" and states it is difficult to say at present exactly how the visual purple acts as a stimulus transformer because so many plausible hypotheses are at hand. It is very probable that light acting upon the visual purple is, according to its wave length, absorbed by particular atoms or molecules, the amplitude of their vibrations being increased. These vibrations may cause corresponding vibrations in certain disks of the outer segments of the cones, which seem especially constructed to take up vibrations. We know that when light falls on the retina it causes an electric current, and the current of electricity set up by light may cause the sensation of light, and the vibrations of the atoms or molecules the sensation of color.

"Causes of color blindness may be divided into two classes which are quite separate and distinct from each other, though both may be present in the same person." In the first class there is light as well as color loss. In the second class the perception of light is the same as the perception of color. In the first class certain rays are not perceived at all, or very imperfectly. Edridge-Green has classified the color blind in accordance with the number of colors which they see in the spectrum. The normal sighted are designated hexachromic and those who see four colors tetrachromic, and so on down to those who see none—the totally color blind.

Our color sense is explained as being the result of evolution, the sense of light having been developed first and then the sense of color, the sense of sight being first developed for those waves which produce the maximum effect upon the sensitive protoplasm. As evolution proceeded, the protoplasm became sensitive to the waves on either side of those which produced the primary stimulus, until the whole of the visible spectrum produced a light stimulus in an eye devoid as yet of color sense. In the physical stimulus which produces the sensation of light there are two factors to be considered, the length of the wave and its amplitude within certain limits the greater the intensity of the sensation. The wave length of the physical stimulus is the physical basis of the sensation of color. The probable commencement of the development of the color sense would occur when evolution had proceeded to the point where discrimination between different wave lengths of light could be made; these would probably be those physically most different in the visible spectrum, i. e., red and violet. The next stage of evolution is when the color perceiving center is sufficiently developed to distinguish three main colors in the spectrum or green which appears in the spectrum or at the third point of greatest physiological difference. Then follows the stage of development until all the colors of the spectrum are visible in those having a normal color sense.

There is a great deal of evidence to show that this is how the color sense was first developed. For instance, in the degree of color blindness just preceding total, the spectrum is seen in this way. I have also examined a woman who became totally color blind apparently through disease of the ear. I examined her when she had recovered a certain amount of color sensation; her sensations were confined to the extreme red and violet. Not only are all the details of the process of the evolution of the color sense supported by all the facts that we can obtain from literature and museums, but the theory accounts for the facts which were previously inexplicable. The distinction between light sensation and color sensation is explained and all the facts of color-mixing complimentary colors and simultaneous contrast. We can understand how, as in many cases which have been recorded, a man may lose his color perception and still have an unaltered sense of luminosity and visual acuity.

When we consider the path along which a visual impulse has to pass and that each cell has probably some special function in connection with that impulse, it is not surprising that we meet with a large number of different defects of color perception and light perception. Defects of light perception are quite distinct from defects of color perception. The chief defect of light perception which is found is shortening of the red or the violet end of the spectrum. Let us consider the influence of a shortened spectrum upon color vision. The first evident fact is that bodies reflecting only light, the rays of which occupy the missing portion of the spectrum, appear black. Defect of light perceptions cannot be explained on the assumption that there is a defect in a light perceiving substance which is sensitive to rays of light from considerable range of the spectrum. A large number of cases in which there is shortening of the red end of the spectrum escapes detection when only the green test is used, as is usual according to Holmgren's instructions.

Defects of color perception.—The color blind have a diminished hue perception and see a less number of colors than the normal. All the symptoms of color blindness are such as we should expect from want of development of the retinocerebral apparatus for the perception for color. This is evident even in the slighter cases which show a diminished color perception compared with the normal. We find that the color blind are much more dependent on the luminosity of the color than the normal sighted; they require a stronger stimulus; they fatigue more easily with colors than the normal sighted; they have a more marked simultaneous contrast; the visual angle subtended by the colored object requires to be larger, and they have a very bad memory for colors.

Dichromic vision.—The cases which come under this head form the class of ordinary red-green blind. It is under this head that nearly every one of the recorded cases may be classed. Vision as far as color is concerned is dichromic, the neutral point being situated in the green of the normal sighted at about 500. All the colors on the red side tend to be confused with each other, therefore red, orange, yellow, and half of the green are seen as one color, the remainder of the green, blue and violet as the other. The luminosity curve in uncomplicated cases is similar to the normal. There may be shortening of the spectrum at either the red or the violet end of a varying degree. All degrees of shortening of the red end of the spectrum may be found. The following will give the normal sighted the best idea of color blindness; it is how the dichromic see the spectrum and explains why they are able to distinguish between colors. Let him regard the dichromic as a man who has two colors, red and violet and white. The purest red is all the red end of the spectrum. This becomes less and less saturated as the violet is approached until the neutral or white point is reached, then violet comes into the white and this increases in saturation to the termination of the violet. The ordinary dichromic, therefore, sees green as a much whiter and less saturated color than red.

Trichromic vision.—These persons see three distinct colors in the spectrum—red, green and violet. They describe the region intermediate between red and green—that is to say, the orange and the yellow as red-green and blue as violet-green. It will be seen therefore that their chief difficulty is distinguishing yellows and blues. A yellow, for instance, which is situated next to a green will be called red, and the same yellow when adjacent to a red will be called green. There are various degrees of trichromic vision, varying from those who are little better than dichromic to those who are tetrachromic. The trichromic rarely find any difficulty with their three main colors —red, green, and violet. N. M. B.

Color Vision and Color Blindness—II.

Edridge-Green, F. W. (*Lancet*, February 11, 1911). Tests for color blindness are of two kinds—namely, those which are used for the purpose of ascertaining the special phenomena of color blindness, and those which are employed when the inquiry is made for some practical purpose. As with visual acuity it is necessary to fix an arbitrary standard. A test for color blindness when it is to be employed for some definite and specific purpose, as, for instance, excluding dangerous persons from certain callings, should be such as to show definitely that the persons rejected are dangerous. A test should be such as to make it impossible for the examinee to be coached through it. This is one of the most important requirements of a test for color blindness and one that is rarely fulfilled. Nearly every one of the tests in general use fail on this account.

A test should be one which can be carried out as rapidly as is possible with absolute efficiency; of two equally efficient tests the one which takes the least time must be selected. A test, therefore, should have no unnecessary details which, though of theoretical interest, are not concerned with the object in hand. The test should be made as easy and as little complicated for the examiner as possible. We wish to exclude all those individuals who are included in the following three classes: (1) those who see three or less colors in the spectrum; (2) those who, whilst being able to perceive a greater number of colors than three, have the red end of the spectrum shortened to a degree incompatible with their recognition of a red light at a distance of two miles; (3) those who are unable to distinguish between the red, green, and white lights at the normal distance through defect or insensitiveness of the cerebroretinal apparatus when the image on the retina is diminished in size.

Essentials of a test for color blindness:

1. Most color blind make mistakes with certain colors but are correct with regard to others. 2. The color blind name colors in accordance with their color perception, and thus show definitely to which class they belong. 3. Colors may be changed to the color blind whilst leaving them unaltered to the normal sighted. 4. The phenomena of simultaneous and successive contrasts are much more marked for the color blind than for the normal sighted. 5. Many color blind match correctly but name the principal colors wrongly. 6. Many color blind recognize colors easily when they are close to them or the surface is large, but fail to distinguish between them when they are at a distance or the image on the retina is small. 7. The color blind are more dependent upon luminosity than the normal sighted and are liable to mistake a change in luminosity for a change of color. 8. The color blind find special difficulty with faint and dim colors. 9. The color blind who have shortening of the red end of the spectrum cannot see reds reflecting or transmitting only rays corresponding to the shortened portion. 10. The color blind find more difficulty in comparing colors when different materials are used than when the colored objects are all of the same nature. 11. Most color

blind find more difficulty with transmitted than with reflected light. 12. The color blind have a defective memory for colors. 13. Colors may be changed to the normal sighted whilst leaving them unchanged to the color blind. 14. The color blind may have a sense of luminosity similar to that of the normal sighted. 15. The dichromic distinguish between the colors of the normal sighted which are included in one of theirs by their relative luminosity and the difference of a saturation which is apparent to them.

The author then describes his lantern, his classification test and the color perception spectrometer.

Objections to other tests for color blindness.—The tests which have been proposed for color blindness are very numerous, but some are so defective that it is rare to detect a single color blind person with them. I have, for instance, tested men whom I knew to be color blind with certain lanterns, with the result that not a single one was detected. All these tests can be passed at the first attempt without coaching by certain dangerously color blind persons, chiefly varieties not known to the inventors, but the chief defect of each is that it is very easy to coach a color blind person to pass it. The surgeon to one of our largest railway companies told me that when they used Holmgren's test they rejected one man in 300, but with my lantern 12 in the same number. All these tests are much better when the persons to be examined have not seen them before. N. M. B.

The Discrimination of Color.

Edridge-Green, F. W. (*British Medical Journal*, July 13, 1911). The author states that if a portion of the spectrum be isolated it will appear monochromatic, the length of the monochromatic region varying with the intensity and wave-length of the light and the color perception of the observer, and describes a series of experiments with prismatic apparatus to prove his point. E. S. T.

Some Ocular and Visual Conditions in Medical Cases.

Taylor, James (*Lancet*, April 22, 1911). Inequality of the pupil is by no means uncommon, and is not necessarily, in my opinion, associated with serious morbid conditions. It is not infrequent to find such inequality of pupil, not only in children, but also in older patients who have suffered from cervical glandular enlargement or suppuration in early life. We may find the Argyll Robertson pupil is present without any other morbid sign; we may find it present on one side without any other disease of the nervous system; we may find it present on one side with signs indicating involvement of other parts of the nervous system, such, for example, as the absence of one or both knee jerks. We may find it also present with very definite signs of tabes, or with very definite signs of general paralysis of the insane. It may also be present associated with marked atrophy about the shoulder girdle. It may be present with a condition of paraplegia, also syphilitic in origin; and I have known it present in a case in which there was a history of repeated hemiplegic attacks, those, no doubt, being the result of syphilitic thrombosis.

Ophthalmoplegia externa.—The author thinks in idiopathic paralysis of one external rectus muscle that in most of the cases in which cold is supposed to be the exciting cause, a careful investigation fails to reveal sufficient justification for this explanation. It is also curious to think that if paralysis of one external rectus may be the result of cold, it does not happen to occur in association with a similar paralysis of the seventh nerve. And I may mention that in all the cases of facial paralysis of peripheral origin that I have seen—and they must now run into hundreds—I have never observed an associated weakness in the sixth nerve. Third nerve paralysis is probably one of the commonest we meet with and is generally syphilitic in origin, the lesion being a gumma in the nerve sheath pressing upon the filament. I need only refer to many of the conditions with which ophthalmoplegia externa is associated, such as tubercular meningitis, post diphtheritic paralysis and intracranial disease. In intracranal tumor the nerves supplying the eye muscles may suffer from direct involvement in the tumor. They may, however, suffer indirectly even in cases in which the growth is far removed from them, e. g., in the cerebellum, either from pressure against the bone, or, as Harvey Cushing has recently suggested, from pressure on them by branches of the basilar artery. In tabes, also, besides the paralysis of the third nerve, which may clear off under antisyphilitic treatment, there may also be permanent paralysis of ocular muscles, probably the result of degeneration of the nuclear cells. There is a form of hemicrania with which third nerve paralysis is associated, the so-called migraine ophthalmoplegique: this probably depends upon a lesion occurring in the course of the third nerve itself; and the condition is characterized by recurrences of paralysis of the third nerve with recurrent headaches, the paralysis clearing up less and less completely after each attack and finally settling down into complete paralysis of all the branches of the nerve.

One disease with which ophthalmoplegia externa is associated is of great importance because of the danger there is of mistaking it for a hysterical condition. I mean the condition of myasthenia.

Optic atrophy is found especially in tabetic cases. The author does not think it occurs in the preataxic stage; it may be associated with Argyll Robertson pupil. Perhaps it is a more correct way to regard those cases as really cases of one and the same disease—a parasyphilitic disease affecting in one case chiefly the spinal cord and the optic nerve, and in the other case affecting the higher centers and giving rise to mental changes and also involving the optic nerve. In disseminated sclerosis there is a form of atrophy met with, but this, in my experience at all events, contrary to the tabetic atrophy, never leads to blindness. I have never known a patient with disseminated sclerosis to become permanently blind, whereas in tabes when optic atrophy once sets in it is the rule, almost without exception, for the patients rapidly to lose sight altogether. In disseminated sclerosis also it is not infrequent to have a central scotoma for colors present, and in that sense the atrophy resembles very closely that met with in the family form of optic atrophy, and also the pallor of the optic nerve which is present in so many cases of toxic amblyopia.

Optic atrophy and its associated hemianopsia which occurs with tumors pressing on the optic chiasm is interesting, as it is the result of pressure and not one of optic neuritis. A simple atrophy. With reference to optic neuritis there is no doubt that tumor of the brain is by far the most efficient cause of this. The author has in a few cases of disseminated sclerosis seen optic neuritis, and believes it to be as a rule retrobulbar neuritis. He is also of the opinion that certain toxic conditions may give rise to optic neuritis, and states it has been described in association with anemia and as a sequel to influenza.

Neuroretinitis is mentioned in association with albuminuria and with glycosuria.

In retinal thrombosis the author assumes that in cases in which there is no associated visceral disease the condition depends upon local arteriosclerosis.

Embolism of the central artery is usually associated with cardiac disease. The author has seen it occur immediately after diphtheria and presumed it the result of detachment of some little patch of fibrin from a heart valve, although the valve showed no incompetence. It ought to be recognized that homonymous hemianopia may occur quite independently of any other paralysis. I have known it now in several instances, and the cases in which it has occurred have been mostly syphilitic. I have known it, however, as a result of embolism, although in most of these cases there is a history of a transient weakness of the corresponding side of the body. But when the patient comes under observation the condition is one of simple uncomplicated homonymous hemianopia. We must assume in such cases that there has been a lesion, probably embolic or thrombotic, in the neighborhood of the posterior part of the internal capsule, in such a position as to interfere permanently with the function of the optic tracts, while allowing the other sensory fibres and the motor fibres to escape completely. Bitemporal hemianopia, of course, is found only in cases in which a lesion is present at the chiasma, and it may be associated with signs indicating the presence of acromegaly. N. M. B.

Significance of Pus in the Anterior Chamber.

Parsons, J. Herbert (*Lancet*, June 24, 1911). Summing up, one may say that hypopyon is always of serious import; that the prognosis is fair if the cause is merely exogenous toxic absorption, bad if exogenous bacterial invasion. In endogenous infection, whether syphilitic or septic, the prognosis is better even in cases of actual bacterial invasion, but much irretrievable damage is often done to the eye, with consequent serious defect of vision. N. M. B.

Actinomycotic Meningitis Due to Sphenoidal Sinus Suppuration, Causing Death Four Days After Excision of Right Eye.

Stevenson, Edgar, and Adair-Dighton, Chas. A. (*Ophthalmoscope*, June, 1911). An interesting case is reported of actinomycotic meningitis due to sphenoidal sinus suppuration occurring soon after enucleation of the right eye.

A blacksmith, aged 62, developed a corneal ulcer of the right eye, from which a virulent strain of pneumococcus was islolated. The cornea sloughed and panopthalmitis developed, necessitating excision of the right eye. On the day following the operation, the temperature suddenly rose to 102°, and acute purulent meningitis developed, resulting in death three days later. Postmortem examination showed an extensive exudation almost completely covering the vertex of the brain. The base showed purulent meningitis also, the cisterna magna being completely filled with purulent exudation. The right sphenoidal sinus presented all the signs of an old chronic suppurative lesion. The whole posterior wall was completely destroyed, so that both sinuses situated much further back than normal, communicated freely with the base of the brain. The optic nerves were in no intimate relation to the sinuses and were healthy. The orbits were also free from infection. Microscopic examination showed typical actinomycotic filaments, no other organism being present, beyond one or two isolated pneumococci.

Of interest in this case is the fact that the meningitis was not pneumococcic in origin secondary to the panophthalmitis, but rather due to actinomyces, a very rare condition. The following explanation is given: The patient suffered from a chronic sphenoidal suppuration, which, as long as he was able to get about and follow his occupation, did not cause him any particular inconvenience, as the pus drained away satisfactorily; but when he was confined to bed, and lay mostly on his back for about a fortnight, the pus no longer drained away, but, owing to the position of the sinus, filled it. The right sinus was the one primarily infected, and it seems more than probable that the stagnation of pus caused the erosion of the thin intersinus wall, and consequent infection of the left sinus. This also became a mere receptable or cistern for pus, owing to its inability to discharge into the nose, on account of the recumbent position of the patient. The pus, therefore, caused necrosis of the posterior wall of the sinus, and so infected the meninges by direct continuity. This mode of infection is illustrated by a case reported by Ortmann, of extradural abscess due to sphenoidal sinus suppuration. The rapidity of the process (fourteen days in this case) may be ascribed to the virulent osteoblastic action common to actinomyces.

W. R. P.

Retrobulbar Neuritis Associated With Nasal Obstruction.

Hett, G. S., and Henderson, E. E. (*Ophth. Rev.*, April, 1911). The association of retrobulbar neuritis with disease of the accessory nasal sinuses is now so well recognized and has so large a literature of its own that cases of this nature are no longer worth recording. The case now reported differs somewhat from the usual type in so far as that, although there was considerable nasal obstruction, no sinus disease was found when the nose was explored, and a complete cure followed the removal cf that obstruction. N. M. B.

Pathology and Treatment of Injuries Caused by Electricity.

Oliver, Thos. (*Lancet*, February 11, 1911). When the organs of vision have been injured by an electric spark, the eyelids may become red and swollen, the eyelashes and eyebrows burnt, or there may be marked hyperemia of the conjunctiva and complaint by the patient of the presence of a foreign body in the eye. A few days afterwards this is followed by a mucopurulent secretion, so that superadded to the primary hyperemia there is an infective conjunctivitis frequently accompanied by a mild iritis. In the retina are found certain alterations which Davier speaks of as electrocution of the retina. The retina loses its transparency, a slight cloudiness surrounds both the papilla and the large vessels, and extends for a short distance beyond them. The papilla seems soft and its borders ill defined. The vessels appear to be smaller than normal, a circumstance which differentiates the lesion from specific retinitis. These structural alterations may be present without any diminution of the field of vision, and although they may persist for a time they are not followed, according to Minto, by atrophy of the optic nerve.

Among the functional eye troubles complained of, mention may be made of dazzling and of the patient seeing objects colored red, accompanied by restriction of the visual area. There are an increased watering of the eyes and photophobia, which make it difficult for the patient to gaze long at objects. A few days after the accident neuralgic pains are experienced in the globe of the eye itself or around it, and although the pains are intermittent they are apt to be specially severe at night and are increased by pressure upon the eyeball and the superficial nerves. The nearer the eye was to the electric flash the greater is the danger to vision. There is always the risk of the trouble assuming the character of hystero-traumatism, where, although images are formed perfectly upon the retina, owing to a purely psychical derangement they are not properly perceived. The treatment of electrical injuries of the eyes is difficult. The conjunctivitis is not readily influenced by eye washes: the neuralgic pains are stubborn to antipyrin and quinine, but yield to bromide of potassium.

N. M. B.

A Case of Myasthenia Gravis.

TAYLOR, JAMES (*Ophthalmic Review*, June, 1911). The case is reported on account of its interest to those dealing with eye diseases because of the early and severe affection of the ocular movement.

It is also interesting on account of the very characteristic variable weakness in the limb and trunk muscles, and the presence of the myasthenic reaction. On these features a definite diagnosis was made, and consequently a very grave prognosis given—a prognosis unfortunately very soon justified. The great enlargement of the thymus, and the normal condition of the nervous system found on postmortem examination are of great importance.

One point in the clinical history should also be emphasized, viz., the curious variability in the weakness already referred to—a variability which is apt to mislead, and to suggest the diagnosis of hysteria—a mistake which has unfortunately been made in many cases of myasthenia.

Treatment in this case was without any effect. Thyroid was tried, because in another case under the writer's care it has been successfully used for a considerable period, and the condition of that patient is now much better than it was some years ago. Its success may possibly depend upon the thyroid neutralizing the effect of some secretion derived from an enlarged thymus.

There was obvious double ptosis, more marked on the right side than the left, and this varied in degree from time to time, but was always most marked in the evening. There was defect in all the ocular movements, and this also was variable. Sometimes a movement, e. g., of deviation, was good, but again after it had been carried out two or three times it became completely suppressed—the muscles apparently tiring very readily. The pupils reacted normally, but after contraction quickly dilated again. N. M. B.

On Dacryops.

Thompson, Ernest (*Ophthalmoscope,* July, 1911). A case of dacryops is reported with the pathological findings obtained from the microscopic examination of the excised portion of the cyst wall.

The patient, a child aged 7½ years, presented a somewhat swollen palpebral fissure of the right side. On looking under the upper lid, a translucent swelling, bluish black in color, was observed between the lid and eyeball, which on eversion of the lid did not prolapse, but seemed to go backward. The swelling extended in the fornix, pretty nearly from the outer to the inner canthus, typically cystic in appearance. An opening was made in the conjunctiva, through which the cyst, very tense, prolapsed. An endeavor to remove it in its entirety failed, and as large a piece as possible of the cyst wall was excised. A probe, introduced, showed the cavity to extend to the orbital wall above.

Microscopic examination of the specimen showed the cystic obstruction to be more or less surrounded by small masses of gland tissue, altered in character by the combined pressure of the cyst and fibrous tissue, showing considerable evidence of inflammatory reaction.

The most reasonable supposition was that the cyst might be due to distension, either (1) of the duct of the main gland, or (2) of the duct of the excessory gland. From the large size, and the distance the probe could be passed into it, it probably involved a secreting portion of the lobule connecting with the duct.

Examination of the literature as to what dacryops really is, leads to the definition:—a cystic dilatation of one or more ducts of the main lacrimal gland, or of the excessory gland of Rosenmueller, and that these glands themselves may in some cases be involved in the cystic process.

The etiology has not been placed upon a satisfactory footing. Zur Nedden came to the conclusion that the reported cases fell into two groups. The first group includes cases which may be regarded as pure retention cysts. In these there is a simple stoppage, from one cause or another, of the excretory duct, and a damming back of the secretion, followed by dilatation of the wall of the duct. The second group takes in the cases in which, in accordance with the theory of Sourdille, there has been a catarrhal inflammation of the mucous membrane of the duct with consequent weakening of its wall, increased secretion and dilatation.

In conclusion, one may say, as Zur Nedden indicated in 1903, that further work is necessary before the etiology of dacryops can be placed on a satisfactory footing.

In all the cases reported, where a portion of the cyst wall was excised, or the cyst removed in toto, a cure has resulted. In one case reported by Berry the cyst entirely disappeared after one puncture W. R. P.

Some Lacrimal Gland Cases.

Griffiths, A. Hill (*Ophthalmic Review*, March, 1911). The affections of the lacrimal gland itself may be considered under the following headings:

1. Acute inflammation leading to abscess.
2. Subacute inflammation, often recurrent.
3. Chronic adenitis leading to hypertrophy.
4. Dislocation of gland.
5. Cysts—Dacryops.
6. New growths.

Reports of cases are appended as follows: Abscess of gland, recurrent inflammation of gland with supervention of iritis, cyst or cold abscess, hypertrophy of gland, subacute adenitis with spontaneous recovery, traumatic cyst of gland, dislocation of gland, dislocation of both glands. N. M. B.

On Technic in Limbal Sclerectomy for Glaucoma.

Holth, S. (*The Ophthalmoscope*, July, 1911). The technic of limbal sclerectomy for glaucoma is described in detail with illustrations of the instruments devised by the author.

It depends upon the three following points:

(1) Subconjunctival opening of the anterior chamber by a very oblique incision, 6 mm. long, with a bent keratome.

This incision permits a very slow evacuation of the aqueous; prolapse of the iris is therefore rare. The ciliary body is not laid bare. The corneal astigmatism is very slight after the operation, less than 1 D., often nil. Rupture of the zonula and intraocular hemorrhage hardly ever occur.

(2) Sclerectomy with a punch forceps; this allows an easy dosage of the scleral excision. The sclerectomy alone is sufficient to secure a permanently normal tension.

(3) An iridectomy, in most cases only consisting of a minimal excision of the iris periphery, ought, however, to be made. This iridectomy is not made for curative purposes, but only to prevent a later prolapse of the iris, which might block the scleral fistula. The round central pupil is, therefore, as a rule preserved. Patients who have a "key-hole" pupil are often afflicted with symptoms of dazzling.

For sclerectomy of the anterior lip an ordinary pattern instrument with blades 3 mm. broad, whose ends are rectangular, is used.

For sclerectomy of the posterior lip a model with blades 2 mm. broad, whose ends are semicircular, is used.

In most cases the sclerectomy of the anterior lip is made through a very oblique stop keratome incision placed 2 mm. to 2.5 mm. from the limbus, either under a subconjunctival pocket or under a stump-angled flap.

The punch forceps operation with conjunctival flap is made in the following manner:

1. An obtuse angled conjunctival flap with broad base and the top 12 mm. from the limbus is first cut, generally upwards. The divergent cuts limiting the flap must end 4 mm. or 5 mm. from the limbus. The first snips to loosen the flap should be superficial, between the conjunctiva and the subconjunctival tissue, to avoid hemorrhage from the great episcleral vessels; within 3 mm. or 4 mm. from the limbus, the snips can be made deeper into the subconjunctiva and the sclera laid bare to the cornea.

2. The patient is asked to look downwards, and the assistant lifts the flap in a vertical direction. The inferior limbus is fixed with elbowed forceps held in the operator's left hand. With the bent stop-keratome in his right hand he punctures the sclera 2 mm. or 2.5 mm. from the limbus for sclerectomy of the anterior lip (0.5 mm. from the limbus for sclerectomy

of the posterior lip); then the keratome is introduced very obliquely into the anterior chamber until the incision is 6 mm. When the keratome, with lowered handle, is withdrawn, every pressure against the globe with the fixation forceps must cease. Otherwise, there will be sudden escape of aqueous and prolapse of the iris. The anterior chamber ought, however, now to be emptied; but slowly, by repeated, slight, short pressure on the posterior lip of the wound. In this way a prolapse of the iris can nearly always be prevented.

(3) The operator himself now lifts, with his left hand, the conjunctival flap, and introduces the lower blade of the broad punch forceps so far under the anterior wound lip that he sees 1.5 mm. of the lip through the upper open blade. A piece of sclera, 3 mm. by 1.5 mm. is quickly cut out (for the posterior lip—incision 0.5 mm. from the limbus) the punch forceps with narrow, round-ended blades is used.

(4) The assistant keeping the conjunctival flap down, the operator grasps the iris periphery with a curved iris forceps (one with stop screws is preferable) and cuts out as little as possible—about 1 mm.—with Wecker's scissors.

(5) The top of the conjunctival flap is sutured with fine black silk.

The chronic glaucoma with an extremely shallow, hardly perceptible anterior chamber, the keratome is not suitable for the incision, and Dr. Holth uses a specially constructed sclerotome covered by a sliding metal cap, which allows regulation of the depth of the incision between 0.5 mm. and 1.25 mm.

Complications are not often seen after the punch forceps sclerectomy. Sometimes the anterior chamber may remain empty for a few days. In some of these cases the transitory detachment of the chorioid, described by Fuchs, after cataract extraction and ordinary iridectomies was seen, in one case remaining so for several weeks, but eventually reattaching and good vision resulting.

Iris has appeared a few times between the fourth and ninth day. Therefore the patients are not permitted to leave the hospital before the tenth day. A single instillation of cocain (5 per cent) and scopolamin (0.2 per cent) or atropin (1 per cent) is sufficient to prevent posterior synechiæ or to loosen them completely when they already exist. This use of mydriatics on glaucomatous eyes is absolutely without danger the first week after the sclerectomy; the tension (tonometrically controlled) is never increased thereby.

From June, 1908, to July, 1910, limbal sclerectomy with punch forceps was performed in 88 glaucomatous eyes. Nearly always tonometrically controlled normal tension (15 mm. to 25 mm. of mercury with the Schiötz tonometer) was obtained, and good, even surprisingly good, effects as regards the sight and visual field.

As after successful iridenclesis operations, there has often been seen considerable decrease in the glaucomatous excavation of the optic disk, repeatedly disappearing completely, following sclerectomy. W. R. P.

A Case Showing Enlargement of the Anastomoses About the Nerve Entrance.

COATS, GEORGE (*Ophthalmic Review*, February, 1911). These anastomoses, according to Leber, connect the retinal and ciliary vascular systems in two situations, the communicating vessels in both instances being scarcely above the size of capillaries: (a) At the level of the sclera purely arterial anastomoses are formed, in connection with the circle of Zinn; (b) At the level of the chorioid anastomosing twigs, both arterial and venous, run (1) forwards, to share in the vascularization of the papilla, (2) straight inwards in the substance of the nerve, (3) backwards immediately within the pial sheath of the nerve.

From pathological causes, or as a congenital abnormality, it would seem that each of these three chorioidal anastomoses may be enlarged. (1) Pathological enlargement of the first group is illustrated by the formation of little tufts and plexuses of vessels on, and at the edge of the papilla, in cases of obstruction of the central vein. The same thing may happen, though much more rarely, in obstruction of the central artery. A congenital enlargement of these twigs would give the picture of a cilio-retinal artery or vein.

(2) Enlargement of the second group gives rise to optico-ciliary vessels, i. e., vessels lying at various levels in the papilla, which pass outwards from the central vessels and disappear into the chorioid at the edge of the disk. These are practically always veins, only two instances of optico-ciliary arteries having been recorded. There is good evidence that their origin

may be either congenital or pathological, in association with optic neuritis, glaucoma or myopia. v. Geuns observed their appearance with the onset of optic neuritis, and disappearance with its subsidence.

(3) Enlargement of the third group results in the formation of chorioidovaginal veins—large chorioidal vessels which disappear at the edge of the disk.

The case reported is unique in that all three anastomoses were simultaneously enlarged. N. M. B.

Dispersion of Pigment in a Tattooed Cornea.

Chance, Burton (*Ophthalmic Review,* May, 1911. When patient, a girl, was four or five years of age, she had an acute attack of ocular inflammation followed by a dense leukoma. Three or four years later this was "painted over" by a native oculist, she being a Russian. Of late the eye had been very painful. Examination showed what appeared to be radiations of the iris tissue were, on the contrary, lines of black pigment in a densely fibrous cornea. These lines were disposed in quite even radiations; five or six were in almost continuous streaks, while several others were in linear clumps. They all were dispersed from a large area at the summit of the cornea. The periphery of the cornea was encircled by a band having points, or illy defined striations projecting inwardly, which suggested that they probably were the condensation at the limbus of what previously had been radiations from the central mass.

The corneal substance was densely sclerotic and fibrosed. The iris tissue could be seen but dimly through the superior portion of the cornea. Here there was a distinct ectasis of the ciliary region. The sclera was congested, and the anterior segment actively inflamed. The eye was enucleated and the microscopic findings given in detail. N. M. B.

Blue Sclerotics and Brittle Bones.

Burrows, Harold (*British Medical Journal,* July 1, 1911), refers to papers on this subject by Rolleston and Eddowes and reports three generations of descendants of a woman whose eyes showed this peculiarity. In the 29 individuals, 13 had blue sclerotics, and of these no fewer than 9 suffered from brittle bones. Of these 9, 7 have suffered from multiple fractures, and there is a definite history of the condition. In the other 2 cases only a single fracture was observed, but all occurred from relatively slight degrees of violence. There is no instance of transmission of blue sclerotics except from a parent who actually showed the condition, and not a single case of fracture occurred in those who had normal sclerotics.

Eddowes suggests that the translucency indicates a want of quantity or quality of the fibrous tissue forming the framework of the various organs of the body, and probably explains the want of spring or toughness in the bones. It is important not to confuse this condition with the slight shade of blue in the sclerotics of many children. In the true cases the sclera is colored a pale china blue and the appearance is very striking. E. S. T.

The Etiology of Iritis.

Yeld, Reginald A. (*British Medical Journal,* May 13, 1911). As a further contribution to the statistical studies upon this subject the author gives an analysis of 159 cases of primary iritis occurring in the wards of St. Bartholomew's Hospital between 1883 and 1900. The results are as follows:

1. Syphilitic	(a) Certain	46		
	(b) Probable	26	72	45.28%
2. "Rheumatic"			26	16.35%
3. Gonorrheal	(a) Certain	13		
	(b) Probable	11	24	15.09%
4. Toxemic			16	10.06%
5. Gouty			2	1.25%
6. Osteoarthritic			2	1.25%
7. Obscure			17	10.60%
			159	

Only one case of possible tubercle was noted and that was so doubtful that it is included in the "Obscure" class. The diagnosis of tuberculous disease has, however, been much improved since 1900. E. S. T.

A Report on Fifty Cases of Trachoma Treated With Carbon Dioxide Snow.

Harston, G. Montague (*British Medical Journal,* July 13, 1911), reports fifty cases of trachoma treated by this method in the Tung Wa Hospital at Hong Kong. All were Chinese.

The snow is collected from a 28-lb. cylinder of the liquefied gas by means of a Prana cage. The cage is then detached from the cylinder and the snow is rammed down tightly into the cylindrical mold attached to the cage. In this way a pencil is formed which is sharpened with a penknife to the required shape. The pencil is then applied to the conjunctiva in the usual manner, but with some little pressure, care being taken to avoid touching the cornea, which gives unnecessary pain. At the first application the snow is allowed to remain in contact with each part for fifteen seconds, but as the patient becomes accustomed to the applications the time is increased to thirty seconds. The treatment, in the author's opinion, is much more effective than where the ordinary caustics are used. The most favorable cases for the method are those which have become chronic. The cases are tabulated. E. S. T.

The Study of Ocular Rotations.

VALK, FRANCIS (*The Ophthalmoscope,* 1911). A plea is made for more general use of the Stevens tropometer in squint, owing to the ineffectiveness of other methods.

The writer has found a deficiency of rotation in all cases of squint or heterotropia demonstrable by the tropometer.

The most favorable rotation is taken as upward 33°, downward 50°, inward 55° and outward 50°, and any deviation from this as a standard for field of version indicates the form and condition of heterotropia which may be present.

This is illustrated by cases of anophoria with an upward rotation of more than 33° and a downward of less than 50°, in which the head is tipped forward, raising the binocular plane of regard. The opposite condition is illustrated in kataphoria, in which the head is thrown backward and the plane of regard lowered.

For similar conditions to the right or left, the names of dextrophoria and laevophoria are suggested.

That squint or heterophoria is not always binocular may be shown by the tropometer, the right eye turning in 50° and out 50°, while the left may go in 60° and out only 35°, while the cover test would show a concomitant squint of the right eye. The author believes that often, without the use of the tropometer, the wrong eye may be operated upon.

W. R. P.

Embolism of the Central Artery of the Retina in a Girl Aged 11¾ Years.

STEPHENSON, SYDNEY (*The Ophthalmoscope,* July, 1911). A case of embolism of the central artery of the retina, unusual because of its occurrence in a child of 11¾ years, is reported.

Of 18 cases of obstruction of central artery of the retina, reported in the last thirty volumes of the *Transactions of the Ophthalmological Society of the United Kingdom,* none was below 16 years of age.

The child suffered sudden loss of sight of the left eye during the night. Subsequent examination presented the typical picture of embolism of the central artery of the retina—filiform retinal arteries, edema in and around the macular region, and a red spot at the fovea centralis, with blurring of the optic disk by the surrounding edema.

The family history was tubercular, but no evidence of inherited syphilis. Wassermann, negative. The child had suffered from rheumatism, scarlet fever and measles. Physical examination: Mitral regurgitation with slight dilatation and associated hypertrophy of the left ventricle. There is no positive evidence of mitral stenosis. The right heart is slightly enlarged. The condition appears to be progressive. No evidence of infarction elsewhere.

In conclusion, the suggestion is made that as obstruction of the central artery of the retina is so rare in childhood and so much more frequent as age advances, the possibility of vascular disease as a far more important effective cause of obstruction than embolism is indicated. W. R. P.

Note on the Efficiency of One Instillation of Scopolamine as a Cycloplegic for Refraction Work.

MARLOW, F. W. (*Ophth. Rev.,* March, 1911). It is assumed that better refractive work can be done with a cycloplegic than without in the great majority of cases, although it must be admitted that in a certain minority its use makes no difference to the final prescription. It is also assumed that in using a cycloplegic as complete a relaxation as possible of the ciliary muscle is desired, so that the static refraction can be measured as accurately as possible.

I am indebted for the first impetus to employ it in the place of homatropine to the suggestion of Dr. Charles A. Oliver, of

Philadelphia. The inconvenience of the frequent instillations necessary in the case of the latter drug, the irritation produced by it and its not infrequent failure to produce a complete relaxation of the cilary muscle made me welcome the change to a drug of presumably greater efficiency, which required only one instillation for the production of cycloplegia in a shorter space of time. The great disadvantage of scopolamine as compared with homatropine, viz., that its effects take about three times as long to pass off, has not proved to be a serious one in practice, although I use a cycloplegic in practically all cases requiring the prescription of glasses up to 40 years of age, and in a certain number of cases even beyond that age.

By using Saturday afternoon and permitting Sunday to intervene before the resumption of work, and the use of a weak solution of eserin (gr. $^1/_{10}$ ad dr. i) or by the use of convex lenses to take the place of the accommodation, the difficulty has been surmounted. I have had no more difficulty in persuading a patient to accept a four-day cycloplegia than the 24-hour cycloplegia of homatropine. The drug was used in a 1/5 of 1 per cent solution and was instilled in a uniform manner.

Examination made usually in one hour after instillation. In a certain number of cases it was found advisable to repeat the application. Cases, for instance, in which previous failures to relieve asthenopia have rendered it essential to make as sure as possible of the static refraction; cases in which the nature of the symptoms makes it more than usually necessary to be sure; cases in which a variability of observers leaves some uncertainty as to whether a complete cycloplegic effect has been produced. A study of these cases in which a second or even a third application of scopolamine has been made, furnishes an opportunity of determining the efficiency of one application of the drug.

An analysis of 66 cases in which the effect on 131 eyes was observed is appended.

The main conclusion from the series of observations seems to be that in a large majority of cases one instillation of scopolamine is just as effective as two, and that even in the cases in which a second application effects a more complete cycloplegia, the change is very slight, usually a negligible quantity. N. M. B.

Eye-Strain in Relation to the General Health.

HINCHELWOOD, JAMES (*Lancet*, February 18, 1911), directs attention to the close relationship which frequently exists between eye-strain and general health.

Eye-strain frequently acts by exhausting the nervous system of the patient, and hence through the medium of brain and spinal cord often has a profound and far-reaching effect on the functions of the various organs of the body and on the general nutrition of the patient. There has been a tendency on the part of some writers, especially in America, to exaggerate the far-reaching effects of eye-strain, and this has given rise to a certain amount of discredit and skepticism regarding the subject. But as experience becomes wider one becomes more and more impressed with the fact that eye-strain has often a most prejudicial effect on the general health of the patient, and that great improvement in this may often be brought about simply by the relief of the eye-strain.

In many cases the eye-strain is accompanied by no pain or discomfort in the eye, but by symptoms altogether outside of the eye itself, and these are the cases which often escape the notice of the practitioner unless his attention has been specially directed to the subject.

Another most important thing for the practitioner to bear in mind is that the symptoms arising from eye-strain may be due to a very small error of refraction, and hence may never be suspected either by the physician or by the patient. Another reason why eye-strain, as a cause of symptoms, is often overlooked is because the patient is already wearing glasses and has derived little or no benefit from them. It cannot be too strongly emphasized that to derive benefit the refractive error must be exactly and properly corrected. In most cases this cannot be satisfactorily accomplished without examination of the patient under homatropine or atropine. This can be properly done only by an ophthalmic surgeon, and nothing requires greater care than the fitting of patients with appropriate glasses.

Headache, insomnia, brain fag, choreiform movements of the facial muscles, vertigo and dyspepsia are mentioned as having their origin in eye-strain. N: M. B.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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Concerning the Results So Far Obtained With the Schiötz Tonometer.

Heilbrun, K., Halle (*Graefe's Archiv. fuer Ophthal.*, Vol. 79, Part 2). *The tension of the normal eye.* The tension of the normal eye is found by Stock, Langenhan, Marple and Heilbrun to vary from about 12-27 mm. Hg. Schiötz's recent investigations show a tension of 15-25 mm. In one hundred eyes Wegner finds a tension ranging from 13 to 30 mm., attributing his higher results to the fact that he examined more young individuals. Heilbrun's results, obtained in 10 to 14-year-old patients, however, never exceeded 27 mm. Langenhan, Engelmann and the writer find the tension in both eyes practically the same, and the tension not dependent upon the age. Heilbrun finds considerable variations in tension on different days.

Eyes with refractive anomalies show no difference compared with the emmetropic eye. In two cases of marked antimetropia Langenhan found the tension of the ametropic eye equal to that of the fellow eye.

The effect of drugs upon the tension of the normal eye.

Holocaine has no effect upon intraocular pressure (Langenhan, Schiötz).

Cocaine causes a slight initial reduction (1.5-5 mm.). Within one to two hours there is a return to normal or a slight increase of tension (Schiötz, Isakowitz, Langenhan, Marple).

Scopolamine 1% in one case showed no change (Heilbrun).

Atropine 1% has no marked effect (Schiötz, Isakowitz, Langenhan, Marple).

Eserine causes a slight increase followed in fifteen minutes by a reduction of tension (2-5 mm.). Normal tension within four to six hours (Wegner, Schiötz, Isakowitz, Langenhan, Marple).

Pilocarpine often causes an initial increase, but usually results in a more constant decrease of tension. That the decrease is not entirely dependent upon miosis is shown by a case of aniridia, in which both eserine and pilocarpine effected a reduction of tension (Schiötz).

Dionin in one case was followed by decreased tension.

The tension of the abnormal eye. After muscle operations and in various corneal affections (herpes, serpent ulcer, interstitial keratitis) decreased tension was observed.

In two cases of lime burn of the conjunctiva and cornea there was increased tension (Heilbrun).

In iritis and iridocyclitis, both an increase and decrease were observed. (The effect of subconjunctival injections of normal salt upon tension in these cases seems to be variable.)

In two cases of unilateral sympathetic disease, no difference in tension in the affected eye was demonstrable.

After cataract extraction a decided hypotonus ensues, the duration being about fourteen days (Langenhan).

Increased tension may complicate simple detachment, and decreased tension intraocular neoplasms. No definite results were obtained in papillitis, neuroretinitis, chorioiditis, etc. (Heilbrun).

Glaucoma.—Every tension above 27 mm. should be considered pathological. A tension under 27 mm. may, however, be pathological if the previous physiological tension was abnormally low. In doubtful cases measurements should be made over a prolonged period and at different times of the day. The tension is especially apt to be high in the morning.

The prophylactic instillation of a miotic in an eye predisposed to glaucoma but still healthy may be followed by disastrous consequences, as is shown in a case which Langenhan reports. Heilbrun mentions a case of marked hypotonus after iridectomy for glaucoma in which subsequently a severe attack of acute glaucoma supervened.

From his own and tonometric examinations of other observers (Stock, Meller, Kraemer, Gilbert) Heilbrun comes to the conclusion that a glaucoma simplex without tension does not exist.

Escrine ½% first slightly increases tension and then causes a decrease, which, however, is not always proportional to the degree of tension. The maximal decrease occurs in one-half to three-fourths of an hour, followed sometimes by an immediate rise of tension (Langenhan).

Pilocarpine 2% seems to effect a more regular but not so marked a reduction (Langenhan).

Cocaine.—According to Langenhan the employment of cocaine in combination with miotics is more harmful than beneficial, because cocaine increases the tension of the glaucomatous eye.

Holocaine does not increase tension.

Atropine and *scopolamine* increase tension.

The ineffectualness of miotics in glaucoma is probably due to their temporary action, leaving the eye exposed to pathological tension many hours of the day. A. C. S.

Results of Diascleral Ocular Transillumination; Congenital Fissured Defect of the Inferior Iris Pigment. (The Most Rudimentary Form of Iris Coloboma.)

LANGENHAN, Berlin (*Archiv. fuer Ophthal.*, Vol. 79, Part 1) publishes the results of his investigations with Hertzell's ophthalmodiaphanoscope. He applied the instrument, as he would a Sachs lamp, to the temporal side of the sclera, just in front of the equator, the eye being rotated towards the nose.

He finds the translucency of the iris dependent upon the degree of pigmentation, the intensity of the illuminant, and upon the size of the pupil. When the pupil is small the iris is stretched, and consequently more translucent. In the majority of cases the margin of the lens nearest the light is visible as a fairly well defined curved line some distance within the limbus, the distal margin being invisible. Under favorable conditions the ciliary processes appear as small, black, club shaped formations.

With the lamp applied as above stated and the eye rotated nasally, there may be seen from behind forward, first, the ora serrata as a dark line 1½ mm. wide and 6-7 mm. from and concentric to the limbus (ora serrata ring); next, a 3-4 mm. wide zone with meridional striations (orbiculus ring); then a darker zone extending to the limbus (corpus ring), adjoining which is sometimes seen a lighter zone, due to light shining through the scleral wall of the anterior chamber (chamber ring).

Würdemann considers the orbiculus ring attributable to the circumlental space, "surrounded by another dark ring caused by the shadow of the ciliary processes." Langenhan is unable to understand why the pigmentation of the ora serrata should be caused by the shadow of the ciliary processes, nor can he follow Würdemann's conclusions regarding the circumlental space in relation to glaucoma predisposition.

In a large percentage of otherwise normal eyes, especially in those of young individuals, the writer found a colobomatous-like defect of the inferior retinal iris pigment, sometimes consisting of disseminated light areas, other times the thinning including the whole width of the iris.

He considers this affection the most rudimentary form of iris coloboma, and analogous to the inferior leucosis of the retina described by Manz and Panse. A. C. S.

Experimental Investigations Regarding the Bactericidal Action of Asurol in the Rabbit Eye.

SCHREIBER, L., Heidelberg (*Archiv. fuer Ophthal.,* Vol. 78, Part 2), concludes that: (a) Conjunctival instillations of asurol (a mercury derivative) or the introduction of asurol ointment have no antiseptic influence on experimental corneal ulcers. (b) Subconjunctival injections are without therapeutic influence. (c) While asurol baths of strong concentration seem to effect a cessation of the disease process, they cause fatal intoxication. A. C. S.

Electric Hand Lamp for Ocular Examination.

KUEMMEL, R., Erlangen (*Muench. med. Woch.*, June 27, 1911), describes a lamp consisting of a dry battery contained in a cylindrical handle, perpendicular to one end of which is attached a shorter tube containing the light filament. At one extremity of this tube is a convex lens of 5 cm. focus, at the other end, in a sliding inner tube, a lens of 3 cm. focus. This end throws a brilliant beam of light (the intensity regulated by the sliding device), useful for oblique illumination, examination of the pupils, etc. The other end gives a larger field of light and may be utilized as the light source in ophthalmoscopy. A. C. S.

The Optical Correction of an Eye Aphakic Since Earliest Infancy by Means of a Zeiss Prism Telescope and Telescope Lupe.

WAGENMANN, A., Heidelberg (*Archiv. fuer Ophthal.*, Vol. 79, Part 1). As not infrequently happens in young aphakic individuals, the patient (a 15-year-old girl, operated on at 11 months of age), preferred to read without any correcting lenses by holding print very close to the eyes. Distant vision, too, could not be improved by glasses.

With the assistance of Dr. Henker and the Zeiss firm a monocular prism telescope and telescope lupe was devised, enabling the patient to see more clearly and to read at a distance of 25 centimeters, the field of vision being 32 mm. The article is illustrated. A. C. S.

Gono-blennorrhea, Inclusion-blennorrhea, and Trachoma.

LINDNER, K., Vienna (*Archiv. für Ophthal.*, Vol. 78, Part 2), refers to the recent publication of Halberstaedter, v. Prowazek, Heymann, Wolfrum and others, and to his own numerous contributions. He claims there is now no doubt that both trachoma and inclusion-blennorrhea are caused by the same virus, the final link in the chain of evidence being contributed by Wolfrum, who was able to produce typical trachoma with scarring in a patient whose conjunctiva he had inoculated with material obtained from a case of inclusion-blennorrhea. The conjunctiva of the newborn is more resistant than the adult conjunctiva, the disease in the former consequently runs a shorter and less severe course.

He divides true ophthalmia neonatorum (all severe conjunctival inflammations of the newborn, excepting catarrhs and conjunctivitis) into two groups—gono-blennorrhea and inclusion-blennorrhea, nearly all of the less virulent conjunctival affections of the newborn belonging to the second group.

In 119 cases studied there were 49 cases of gono-blennorrhea, 53 cases inclusion-blennorrhea, 4 mixed cases (gonococci and inclusions), and 13 catarrhal or conjunctival affections with negative findings.

Gono-blennorrhea.—The author's investigations furnish further proof that incubation periods exceeding three days are extremely rare. They also indicate that the degree of lid swelling and purulent discharge is not always proportional to the severity of the infection. Sometimes the disease gives rise to fine conjunctival cicatrices.

The gonococcus is found in greatest numbers adherent to the epithelium or intraepithelial, and not in the secretion, as commonly supposed. An early diagnosis (before secretion has been established) may often be made by examination of the epithelium.

Inclusion-blennorrhea usually sets in five to nine days after birth. The first stage resembles gono-blennorrhea; there being marked edematous swelling and redness of the lids. The secretion, however, is of a more serous character, less profuse and often flocculent or shreddy. Pseudomembrane formation frequently occurs. Corneal complications are rare. Typical of this variety is the marked bulging and infiltration of the retrotarsal folds, especially of the lower. In more advanced cases the bulging conjunctiva assumes a granular aspect, and smear preparations show Leber's bodies in large numbers.

Re-examination after the lapse of one year was made in 12 cases. Eight (12 out of 20 eyes) cases showed scarring. In 5 cases inflammatory symptoms were still in evidence.

Inclusions and initial bodies usually appear about the same time. In the catarrhal forms inclusions are scarce, the number apparently being proportional to the severity of the infection.

Years ago Fuchs in his text book called attention to the conjunctival cicatrization which occasionally follows gonorrheal conjunctivitis, but no investigations were made to determine whether this occurred more often after gonorrheal or non-gonorrheal ophthalmia. Even the author's series of cases is unable to answer this question with any degree of certainty.

Lindner concludes that inclusion-blennorrhea is a chronic affection of the conjunctiva of the newborn, characterized by acute or subacute onset, by granule formation (how often further histological studies must decide), and usually by a cicatricial healing process.

Furthermore, that trachoma, originally a purely genital affection, after being once transferred to the eye, results (because of its chronic course) in an ocular affection entirely independent of the genital affection, an ocular affection disseminated by eye-to-eye infection.

The relatively rare transference of this virus from the genitalia or from inclusion-blennorrhea to the conjunctiva of the adult may, where hygienic conditions are not of the best, be the cause of new trachomatous foci in previously non-trachomatous regions. A. C. S.

On the Trachomatous Changes in the Scleral Conjunctiva.

Ichikawa, K., Kyoto (*Archiv. fuer Ophthal.,* Vol. 79, Part 1), concludes that:

1. The scleral conjunctiva also undergoes trachomatous changes, the healthy appearance being only apparent.

2. The character of the trachomatous changes is the same as occurs in pannus.

3. Preponderance of plasma cells and the subepithelial surface extension in a thin layer are typical of this granulation tissue.

4. The occurrence of such a characteristic infiltration in the scleral conjunctiva is perhaps pathognomonic of trachoma only.

In the future the anatomical determination of a positive, experimental inoculation should be based upon examination of this portion of the conjunctiva, rather than upon the examination of the conjunctiva of the lids and fornix.

5. The finding of these trachomatous changes in the scleral conjunctiva lends further support to the view that trachoma is akin to other granulating inflammations, such as tuberculosis, lues, etc., and that follicular development is entirely independent of the real trachomatous process.

6. In most cases pannus represents a direct, continued propagation of the trachomatous conjunctival inflammation.

A. C. S.

Illustrative Contribution to "Dystrophia Epithelialis Corneæ of Fuchs."

Knapp, Paul, Basel (*Archiv. fuer Ophthal.*, Vol. 78, Part 2), reports an example of this affection in a 74-year-old woman on whose right eye he had performed a cataract extraction in 1905. Although the patient commenced to complain of failing vision in 1907, no corneal disturbances or increased tension were noted until two years later.

He believes the opacity results from a chronic edema of the cornea, especially of the epithelium. Contending that every edema is improved by massage, he attributes the invariably worse vision in the morning to nocturnal cessation of lid massage. Moreover, systematic massage of the cornea with the finger tip on the upper lid (300-500 compressions) was always followed, in the author's case, by marked immediate improvement of vision and clearing of the cornea. So far, however, the improvement has only been temporary. A. C. S.

On Corneal Infection Due to Bacillus Pyocyaneus.

Pagenstecher, H. E., Strassburg (*Archiv. fuer Ophthal.*, Vol. 79, Part 1), reports a case of progressive corneal ulceration in a 5-year-old child. The ulcer perforated, the iris prolapsed and the eye finally had to be enucleated.

From the bacteriological findings he concludes that— 1. Bacillus pyocyaneus may lose its ability to form pyocyanin. 2. Pyocyanin may form late. 3. Therefore, in rapidly progressive corneal ulcerations showing bacillus fluorescence (an organism resembling bacillus pyocyaneus, but not pathogenic to the human cornea) in culture, but no pyocyanin formation, a diagnosis of pyocyaneus infection should nevertheless be made.

A. C. S.

On the Etiology of the Chronic Ocular Affections.

Wolff, L. K., Amsterdam (*Archiv. fuer Ophthal.*, Vol. 79, Part 1), reports 48 cases of diffuse keratitis, 23 of which gave a positive Wassermann, the v. Pirquet test being positive in 14. He concludes that in leutic disease of the cornea— 1. The cornea is entirely involved. 2. There occur deep vessels of Hirschberg, rarely superficial or no vessels at all; never other deep vessels. 3. Scleritis is rare and not nodular in character. 4. The affection generally occurs before the thirtieth year. 5. Posterior synechiæ rarely intervene.

In tuberculous disease of the cornea—1. The cornea is only partially affected. 2. Hirschberg vessels never occur; often, however, other deep or superficial vessels. 3. Nodular scleritis is common. 4. The affection is as frequent before as after the thirtieth year. 5. Posterior synechiæ are common, in spite of careful atropine medication.

He also discusses 43 cases of iritis and iridocyclitis. In 18 the Wassermann was positive, in six the v. Pirquet test.

He considers the following points characteristic of tuberculous iritis: 1. An unusually protracted course, the disease often starting after the thirtieth year. 2. In every case many posterior synechiæ in spite of proper atropine therapy; occasionally white thickening of the synechia at the iris margin, which he considers quite typical of tuberculosis. Often secondary glaucoma in cases not iridectomized. 3. Many precipitates covering a triangular area in the lower third of the cornea. Precipitates may be of large size (mutton fat). 4. Occasionally a yellowish infiltration in the angle. 5. Often vitreous opacities, sometimes dustlike. 6. Fairly often gray nodules on the iris (very characteristic). The same holds for the small, round, black (atrophic) regions in the iris, the remains of tubercles. 7. Local ocular reaction to tuberculin injections. A. C. S.

On Internal Rupture of the Sclera.

Fuchs, E., Vienna (*Archiv. fuer Ophthal.*, Vol. 79, Part 1), reports the anatomical findings in two cases of internal rupture of the sclera, contributing further evidence in support of the view that all scleral ruptures proceed from within out.

From these findings he concludes that the scleral tear begins at the pectinate ligament, which is torn through, thus opening up Schlemm's canal. In the simplest case no other lesions are found. Simple laceration of Schlemm's canal may be suspected when, after a contusion, a profuse hemorrhage occurs into the anterior chamber, and after the absorption of the hemorrhage no iris tears are visible.

After more severe contusions the tear extends from Schlemm's canal to the inner scleral layers. The torn layers may separate and by the action of the ciliary muscle the sclera be divided into an inner and outer lamella. This gap soon becomes filled in with new formed tissue, the subsequent contraction of which may lead to difficulty in discovering the original separation between the anterior and posterior lamellæ. The root of the iris falls into the breach, causing narrowing of the free portion of the iris, sometimes the only permanently visible sequela of an internal rupture of the sclera. Since other affections, however, may lead to the same clinical picture, a diagnosis of internal scleral rupture based upon this sign alone is not possible. The laceration of Schlemm's canal and the incarceration of the iris leads to increased tension. This may explain certain cases of increased tension after contusion in which no other causes for increase of tension exist.

In most cases, however, a more pronounced separation of the inner layers with protusion of the external layers occurs, which protusion, with the onset of increased tension gradually increases in size.

A clinical diagnosis of internal scleral rupture may be made, if after a contusion no signs of perforation appear, but after disappearance of suffusion and swelling, a dark blue line concentric to and near the limbus becomes manifest, especially if later an ectasia forms in this locality. Other signs include narrowing or complete disappearance of the iris near the ectasia with retraction of the pupil. Often a luxation of the lens coexists.

In conclusion, he refers to the clinical histories of two rather atypical cases. In the first case the eye was struck by a piece of iron, causing a circumscribed ectasia of the sclera, the anterior border of the ectasia being 7 mm. behind the temporal limbus. He considers this an example of direct rupture of the inner scleral fibres brought about by indentation of the sclera at this point. As an example of indirect rupture, he cities case 2, in which a contusion was followed by the formation of two scleral ectasias near the limbus. Signs of old scleritis were present in the other eye, and a history of previous inflammation in both eyes was obtained. A. C. S.

Serous Iridochorioiditis Following the Long Continued Retention of Steel in the Eye.

Rubert, J., Kiew (*Archiv. fuer Ophthal.*, Vol. 78, Part 2), reports a case in which a steel particle was retained in the eye for nearly twelve years without giving rise to inflammatory symptoms, to be then followed by recurring inflammatory attacks for a period of four years before the patient consented to enucleation. The histologic findings are published in full and the following conclusions drawn: 1. Chronic serous iridochorioiditis may be caused by an aseptic penetrating steel particle. 2. Chronic serous iridochorioiditis is characterized by a typical histological picture, the result of chronic proliferation of the uveal tissue. 3. The precipitates found on the posterior surface of the cornea in serous iritis may originate solely from the iris, and in the simultaneous presence of iritis should not be regarded as symptoms of a cyclitis. 4. Owing to the action of iron, Descemet's endothelium may proliferate, with the production of connective tissue layers on the posterior corneal surface. 5. The epithelium like cells which in rare cases are found on the inner surface of the retina may at times originate from the pigment epithelium. A. C. S.

Hole Formation in the Fovea Centralis.

Fuchs, E., Vienna (*Archiv. fuer Ophthal.*, Vol. 79, Part 1). This affection, as described by Kuhnt and Haab, is characterized ophthalmologically by a red disk at the fovea 1/2 to 2/3 disk diameters in size, whose base compared with the margin often shows a refractive difference of 1 to 2 dioptres. The adjacent retina may be slightly veiled or studded with white specks; occasionally minute yellow specks are seen in the excavation.

Fuchs describes the histological findings in an eye with intercalary staphyloma the result of corneal ulceration. There was elongation of the globe, excavation of the disk, extensive retinochorioidal changes and hole formation in the fovea. The ophthalmoscopic picture would have closely corresponded to the description cited above, except that the size of the hole was only 1/4 to 1/3 disk diameters. The only other case in which the anatomical findings (within the retinal defect, normal chorioid, with complete absence of the retina, or at most covered by only a delicate, transparent membrane) accorded with this fundus picture is a case of postoperative iridocyclitis reported by Coats.

Fuchs believes that in the majority of cases the anatomical process responsible for hole formation is probably the same; microscopical examinations indicate that the retinal atrophy associates itself with the formation of fluid containing lacunæ. There may be primary fluid exudation followed by secondary pressure atrophy (albuminuric retinitis, neuritis), or primary tissue atrophy followed by cavity formation (senile cases).

In traumatic cases he considers edema probably the primary causative factor. Contusions might, however, cause serious molecular changes in the cells and fibres, followed by death and absorption of the cells without the occurrence of extravasations or lacerations, resulting in complete hole formation without being preceded by the usual lacunar alterations.

A. C. S.

Experimental Histological Investigatons Concerning Detachment of the Retina and the Effect of Operative Therapy.

Birch-Hirschfeld, Leipzig (*Archiv. fuer Ophthal.*, Vol. 79, Part 2), submits the following deductions:

1. The anatomical examination of thirteen rabbits' eyes in which a permanent retinal detachment was produced by suction of the vitreous gave results confirming the significance of preretinal band formation in the etiology of the detachment, to which Leber called attention.

2. It also showed that by glial proliferation in the region of the destroyed external retinal layers, and particularly by glial agglutination of the retinal folds, a marked shortening with stretching of the detached retina may be brought about, often resulting in spontaneous tears.

3. By the usual operative measures (puncture, puncture and cauterization, electrolysis) a permanent reattachment was effected in a few cases, in cases showing slight retinal or preretinal changes.

4. In most cases these measures failed or resulted in only temporary improvement, even in cases in which partial agglutination had taken place, the progressive vitral and retinal processes causing cordlike retraction and laceration of the retina at the margin of the adhesion. Ocasionally connective tissue bands formed from the puncture site to the vitreous, to which strands the retina attached itself.

5. After scleral cauterization more extensive adhesions formed than after simple puncture, but the results were no better.

6. After electrolysis chorioidal changes (round cell foci, vacuole formation) occurred.

7. A catgut suture introduced into the subretinal space was

absorbed without demonstrable inflammation of the retina or chorioid, followed by flat agglutination and cystoid cavernous spaces at the site of the scleral perforation.

8. Deutschmann's operation was successful once and failed once. No injurious results were demonstrable. A. C. S.

Investigations Concerning Glaucoma and Blood Pressure.

Kuemmel, R., Erlangen (*Archiv. fuer Ophthal.*, Vol. 79, Part 2), arrives at the following conclusions: A comparative study between 30 cases of glaucoma and 90 nonglaucomatous cases according to age showed a decidedly higher average blood pressure in the former group of cases. The differences were most marked during systolic, less marked during diastolic, and least marked during pressure amplitude, showing the importance of determining the systolic pressure. Furthermore, inasmuch as symptoms of cardiovascular or renal disease generally coexisted, glaucoma in the majority of cases must be viewed as part of a general affection. A. C. S.

Intraocular Pressure, Glaucoma, and Myopia.

Zirm, E., Olmuetz (*Archiv. fuer Ophthal.*, Vol. 79, Part 1), believes that the chorioid regulates intraocular tension through vasomotor stimuli emanating from definite ocular vasomotor centers, the irritation being conveyed to these centers principally from the iris. The tonus of the iris vessels, the condition of iris tension and the variable size of the pupil are closely related to these centers controlling the capacity of the ocular vessels, especially of the chorioid, thereby regulating intraocular tension. Mydriatics probably cause permanent irritation.

As long as these centers act normally, ocular tension remains constant. If, however, these centers are pathologically irritated, there results increased quantity of blood in the chorioid, due to dilatation of the vessels. This congestion corresponds clinically to the prodromal stage of glaucoma, and may be overcome by the counteracting elasticity of the sclera. When the irritation is intense, the natural protective mechanisms are insufficient, ocular tension rises and the chorioidal congestion persists (glaucomatous attack).

Increase of intravenous pressure is followed by fluid and later by cellular extravasation (inflammation). Repeated attacks impair the elasticity of the sclera, normal tension being attained with increasing difficulty. Inflammation leads to adhesions in the angle, thereby favoring continued increase of tension.

Secondary glaucoma differs from primary glaucoma in that clinically demonstrable causes (iris incarceration, posterior synechiæ, etc.) of vasomotor irritation exist.

The curative effect of iridectomy is attributed to the relief of mechanical tension resulting from vasomotor irritation. The existence of iris tension is suggested by the position of the sphincter angles (drawn towards the periphery), after iridectomy in nonglaucomatous eyes these being in the pupillary circle. Miotics may also effect diminution of tension.

The increase of hyperopia observed in glaucoma, he attributes to increased approximation to the spherical shape and to the advance of the retina because of chorioidal congestion.

Factors predisposing to chorioidal venous stasis may be preexisting dilatation of the chorioidal veins, cardiovascular disease, emphysema and inherited predisposition to psychical influences.

The more imperfect development of the chorioid in the myopic eye renders it less subject to congestive disturbances and consequently glaucoma rarely intervenes. A. C. S.

A Case of Bilateral Glioma Retinæ, Enucleation of One Eye and Atrophy of the Other Eye of Almost Eleven Years' Duration.

Kniepek, Clara, Heidelberg (*Archiv. fuer Ophthal.*, Vol. 78, Part 2), after reviewing the cases of glioma retina or supposed glioma retina in which subsequently phthisis bulbi developed, cites the following case history: A ten-weeks-old male child was brought to the Leber clinic in 1899 for examination, the resulting diagnosis being bilateral glioma retinæ. The glaucomatous eye was enucleated the day of admission, the subsequent microscopic examination confirming the clinical diagnosis. The parents refused to have anything done to the other eye. The patient then disappeared from observation until 1910, when Prof. Leber again saw the patient in the Ilvesheimer Blind Asylum. There was complete phthisis bulbi. The parents stated that after leaving the hospital in 1899, this eye gradually increased in size, became painful but not injected. One morning they were surprised to find the eye very small and discharging. A gradual further diminution in size ensued.

In the majority of similar reported cases the observation period of phthisis varied from several weeks to several months. In v. Ammon's case of probable glioma the duration was six years. In quite a few phthisis was followed by renewed gliomatous proliferation.

Knieper believes in her case the atrophy will probably remain permanently; however, the case will be kept under observation. A. C. S.

A Case of Angioma of the Chorioid.

Bergmeister, R., Vienna (*Graefe's Archiv. fuer Ophthal.*, Vol. 79, Part 2), describes a case in a 26-year-old woman. At the time of enucleation there was atrophy of the iris, anterior synechiæ, behind the lens a yellowish brown reflex, anterior scleral staphylomata, secondary glaucoma and amaurosis.

Histological examination revealed the entire posterior half of the chorioid thickened by an angiomatous tumor formation —an angioma simplex with telangiectasis. Of the 14 cases so far reported, only Wagenmann's case showed such widespread infiltration. There is no characteristic fundus picture.

Of interest in the author's case was a nodular endarteritis in the extrascleral portion of the short ciliary vessel, considered by him a form of "endarteritis compensatoria Thoma's."

A.C. S.

A Rare Form of Retrobulbar Cyst (Originating from Detached Nasal Mucosa).

Heilbrun, K., Halle (*Archiv. fuer Ophthal.*, Vol. 79, Part 2), reports a case of unilateral exophthalmos in a 44-year-old man, the first diagnosis being luetic periostitis because of a positive luetic history (Wassermann, negative) and the effectualness of large doses of sodium iodide. A recurrence of the symptoms suggested sarcoma, and an exploratory incision was resorted to, disclosing a large retrobulbar cyst filled with clear fluid, not communicating with the nose. Nine days later a Kroenlein operation was performed and the cyst extirpated.

Anatomical examination revealed a thick walled cyst, the greater portion without epithelial lining. The epithelium present was stratified columnar in type, resembling that of the upper respiratory tract. Mucocele and dermoid cyst could, therefore, be excluded, and the cyst had to be considered as belonging to those originating from congenitally detached nasal mucosa, examples of which have been reported by Mendez and Panas.

The author believes that the temporary improvement in his case and the complete cure in H. Pagenstecher's case of orbital tumor, after the administration of large doses of sodium iodide, is evidence of the value of this drug in affections of this kind. In every case of orbital tumor, therefore, this treatment should be tried before resorting to operative measures.

A. C. S.

On Tumors of the Hypophysial Region.

KUEMMEL, R., Erlangen (*Muench. med. Woch.*, June 13, 1911), after reporting four case histories with autopsy findings (aneurism of the circle of Willis) in one, concludes that in the diagnosis of tumors of the hypophysial region the most important symptom to be visual impairment with associated bitemporal hemianopia. (In two of the above cases, hemichromatopsia.) Other types of anomalies of the visual field, however, may occur. Optic atrophy is a usual, papilledema a rare complication.

Other suggestive signs include acromegalic symptoms, giantism, more rarely disturbances of the genital function, obesity, infantilism, amenorrhea. Glycosuria and polyuria are the least reliable symptoms. Enlargement of the sella turcica, found by X-ray examination, is a valuable aid in the diagnosis.

A. C. S.

Ophthalmological Bagatelles.

REUSS, V. A., Vienna (*Archiv fuer Ophthal.*, Vol. 78, Part 2), finds a double stain of value in the study of superficial corneal affections. He instills fluorescene and follows this by the instillation of ½ to 1% methylene blue, which only stains the corneal parenchyma. (Pyoktanin may be employed instead, but is objectionable, because it stains the conjunctiva and skin an intense violet.) Ulcers stained thus appear dark blue with a greenish border; covered defects stain only green. The picture in dendritic keratitis is particularly striking.

He also writes favorably of electrolysis in xanthelasmata and corneal ulcers, in particular the dendritic and fascicular varieties. The negative pole in the shape of a small platinum knob should always be applied to the cornea first, and in dendritic keratitis this electrode should be carried along the ulcer channels. Five to six milliamperes current strength usually suffice.

A. C. S.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

CLARENCE LOEB, M. D.,

ST. LOUIS,

AND

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Ampullary Corneal Ectasia in Ophthalmia Neonatorum.

TRUC, H., Montpellier (Kèratocèle antèrieure. Ectasie kératique ampullaire dans l'ophtalmie des nouveau nés, *Revue Générale d'Ophtalmologie*, 1911, Vol. XXX, p. 193), reports the case of a child whose eyes at birth were carefully cleansed with boiled water. Nevertheless the right eye became inflamed on the second day after birth and the left on the sixth. The eyes under treatment for three weeks with silver nitrate, argyrol and boric acid lavage apparently recovered, but again began to discharge two days after cessation of drops. Under treatment, the discharge soon ceased, but the child became very feeble, lost in weight, and one week after the beginning of the second attack presented a greyish projection in the center of the right cornea. This increased in size very rapidly. There was no anterior ulceration, but Descemet's membrane seemed perforated. Under 2% pilocarpine, the condition remained stationary and then rapidly disappeared, leaving a small, central leucoma. This gradually cleared up somewhat, though a slight leucoma with anterior synechia still persists. This case is one of the few that have been reported, and the author advises that the silver salts be not stopped too early. The lesion, however, was probably due to a malacia of the cornea, due to general malnutrition accompanied by a fistula of Descemet's membrane. C. L.

Keratoglobus.

Longuet (Contribution à l'etude du keratoglobe, Thèse de Lyon, 1910; Abst. in *Rev. Gén. d'Opht.*, 1911, Vol. XXX, p. 210) claims that this condition is essentially glaucomatous, due to hypertension. In addition, there must be an anatomic predisposition on the part of the cornea or sclera, which, however, plays a subordinate role. It is distinct from postinflammatory ectasia by its transparency and regularity, and from hydrophthalmus by signs of hypertension. The treatment is antiglaucomatous, though the surgical treatment is not free from danger. Correcting glasses should be prescribed.

C. L.

Novoiodin as Ophthalmic Remedy.

Whickerkiewicz (La novoiodine comme remède ophtalmique, *Revue Générale d'Ophtalmologie*, 1911, Vol. XXX, p. 241) reports great success with this remedy in suppurative lesions of the eye, especially in ulcus serpens. Even in gonorrheal ulcers the disease has been very favorably influenced. He uses it as follows: A powder is made, composed of 1 part of novoiodin to 10 parts of white pulverized sugar. Into this is dipped a rod coated with vaselin or some ointment, and this is placed in the conjunctival sac. It was found to act very well in suppurations following cataract operations, dacryocystitis, phlyctenulosis, chronic conjunctivitis, etc. It is a good analgesic. C. L.

Ocular Complications of Mumps.

Tronyo (Complications oculaires des oreillons, *Thèse de Lyon*, 1910; Abst. in *Revue Générale d'Ophtalmologie*, 1911, Vol. XXX, p. 281) states that the ocular complications of mumps are more frequent than has been supposed. They consist of conjunctivitis, keratitis, iritis, optic neuritis and hemeralopia. C. L.

Unilateral Ocular Symptoms in Exophthalmic Goitre.

Le Gras de Vaubercey (Les symptômes unitatéraux dans le goitre exophtalmique, *Thèse de Lyon*, 1910: Abst. in *Revue Générale d'Ophtalmologie*, 1911, Vol. XXX, p. 281) reports two cases where the ocular participation was unilateral. Though this condition undoubtedly exists, it may become bilateral at the end of several years. The left side is more frequently affected than the right. It is probably due to a local excitation of the cervical sympathetic, due to a secretory disturbance in only one lobe of the thyroid. C. L.

How to Act in a Case of Magnetic Foreign Body in the Retina.

Genet (Conduite à tenir en présence d'un corps étranger magnetique de la retine, *Revue Générale d'Ophtalmologie*, 1911, Vol. XXX, p. 289) discusses only the small metallic substance which has penetrated the eye and lodged in the retina beyond the ciliary zone. The first case reported is that of an eye which was enucleated on account of sympathetic disturbances caused by the entrance into the eye of a piece of steel seventeen years before. The second case was that of a forign body temporarily tolerated, but later extracted by a giant magnet. The third case was that of a foreign body extracted twenty hours after the injury. Consequently, he advises the extraction of the foreign body at once, if possible, or at least before the wound has closed. The attempt may be futile, but is not dangerous. C. L.

Contribution to the Study of the Tuberculin Therapy in Certain Affections of the Anterior Segment of the Eye, of Probable Tubercular Origin.

Godechoux (Contribution a l'étude de la tuberculinothérapie dans certaines affections du segment antérieur de l'oeil d'origine tuberculeuse probable. *Thèse de Paris*, 1910; Abst. *Revue Générale d'Ophtalmologie*, 1911, Vol. XXX, p. 307) reports three cases and draws the following conclusions:

In old intractable lesions of the anterior segment one must think of tuberculosis, and try the tuberculin therapy. The doses employed were successively 1/40 mg., 1/20 mg., etc., to 1 to 2 mgs. Very favorable results were obtained. C. L.

Epidemic Gonococcus Conjunctivitis in Egypt, and Its Relation to Trachoma.

Meyerhof, Cairo (Sur la conjonctivite gonococcique épidémique d'Egypte, et ses rapparts avec le trachome, *Archives d'Ophtalmologie*, 1911, Vol. XXX, pp. 287, 373), claims that epidemic gonococcic conjunctivitis is the cause of about 40% of the blindness in Egypt. The disease was known in antiquity, and later the troops of Napoleon suffered from it. The author found the gonococcus the cause of 20% of 2,466 cases of acute conjunctivitis. The disease is found rampant in tropical and subtropical regions, and becomes rarer as the colder climates are approached. The number of cases seems to vary directly with the temperature. Flies are not responsible, because they are most numerous when the cases are fewest. The table of ages is very interesting:

Newborn	5
Nurslings	43
Infants, 1 to 5 years	203
Children, 6 to 10 years	99
Children, 11 to 15 years	18
Youths, 16 to 20 years	18
Adults, 21 to 50 years	84
Patients above 50 years	11
	481

According to this, ophthalmia neonatorum is very rare, about 1%. There are three principal types of the disease: (a) Grave, or blenorrhagic, which corresponds to the classic cases, and is the most numerous; (b) light, or catarrhal, where it is sometimes necessary to make a culture before the gonococcus can be demonstrated, and which is the rarest form; (c) chronic or metablenorrheic, under the picture of an untreated acute conjunctivitis, with remissions and exacerbations; it may be complicated by trachoma. In the third form corneal complications are frequent, and the disease may be transmitted to others in a more virulent form.

While the germ found in the secretions corresponds microscopically to the gonococcus, it has been possible to grow cultures only in five cases. The infection is not direct from the genitals, as witness the rarity of cases in the newborn, but rather from some eye previously affected, usually that of a child, from whom the rest of the family become infected, probably through handkerchiefs, towels, etc. From his observation, the author is able to assert that the gonococcal infection attacks with predilection eyes already affected with trachoma. In 471 cases of blenorrhagia he noticed this complication in 165 cases. In these cases the gonococcal infection was less severe; the trachoma seemed to protect the eyes, probably by means of the very prevalent pannus tenuis. On the other hand, the florid type of trachoma may be aggravated by the gonococcal infection. In 471 cases the cornea was involved unilaterally 133 times and bilaterally 58 times; children were affected 141 times, adults 50 times; 3 each developed during treatment. The sequelæ were: Adults, binocular blindness, 20; monocular, 46; total, 86. Infants, monocular, 23; binocular, 13; total, 49. The corneal complications were divided as follows:

	Facets and Corneal Wounds	Leucoma	Adherent Leucoma, Staphyloma, Fistulæ	Phthisis Bulbi
Children	55	43	72	7
Adults	10	12	45	5
Total	65	55	117	12

The treatment of gonococcic conjunctivitis varies from that employed in Europe. The protection of the healthy eye is practically impossible in patients under six years, so the author uses a daily prophylactic instillation of 2% silver nitrate, or a semi-daily instillation of 10% protargol. Hospital treatment is practically out of the question. The "flying hospitals" do good service, but unfortunately they are not available when the epidemic is at its height.

The author uses 2% silver nitrate, accompanied by a home treatment of lavage with a sublimate solution and repeated instillations of freshly prepared 5% protargol. If the inflammation does not subside, recourse is had to 5% silver nitrate, and even the stick. The treatment must, therefore, be an energetic one. Prophylaxis is important and should start with the oculist himself. The patient should be isolated, if possible, and cleanliness should be enforced. The masses should be instructed in the dangers of the disease and the method of avoiding it.

An extensive bibliography concludes the article. C. L.

Strabismic Amblyopia; Its Cause in Disuse of the Eye, and Its Cure by Exercise.

LAGRANGE (De l'amblyopie strabique; sa cause dans le défaut d'usage, sa guerison par l'exercice, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 193) made a study of 600 cases of strabismus at the Hôpital des Enfants, at Bordeaux, and believes that amblyopia prior to the strabismus is the exception, whereas amblyopia ex anopsia is the rule. He divides the cases into three groups:

(1) Alternating and intermittent strabismus; the visual acuity is almost invariably the same in each eye.

(2) Monolateral strabismus, beginning during the first three years of life; the visual acuity in the deviating eye is always very low. However, it cannot be said that it has been lost; rather it should be said that it has never been acquired. Even after the best correction, the vision seldom rises above 1/10.

(3) Those cases where the strabismus comes after age of ten. This is the most important group, as it clearly demonstrates the loss of vision from disuse of the eye, which varies according to the length of time the strabismus has lasted. The statistics are: less than one year, V. = 1-1/2; three years, V. = 1/2-1/3; four years, V. = 1/3-1/5; five to six years, V. = 1/2-1/7; seven to ten years, V. = 1/7-1/10; more than ten years, V. = 1/10-1/20.

The author cites a case where neglect in wearing the proper correcting lenses resulted in a fall of visual acuity from normal with correcting lenses to 1/7 even with lenses, although the position of the eyes was good, following a double tenotomy. He explains the fact that in some old cases of strabismus the deviating eye is not amblyopic by assuming the formation of a false macula. Another objection is that paralytic strabismus is not accompanied by amblyopia. It does appear, however, when the deviation is very great and persists for a long time. He warmly advocates exercise of the deviating eye, by wearing an occlusive bandage over the other, following this treatment by the use of the stereoscope and diploscope. In this way the visual acuity has been raised in certain cases to normal or almost normal. C. L.

Results of Treatment of Lacrimal Obstructions by Drainage With Skeins of Thread.

Ostwalt, F. (Traitement de l'obstruction des voies lacrymales et de ses suites par drainage a l'aide d'echeveaux de fils, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 204), says that although Bowman's method marked an immense progress in the treatment of lacrimation, it has its dangers and is very unpleasant for the patient, nor is it invariably successful. The use of the style was an advance in the treatment, but it acts as a foreign body, irritating the eye. A modification of this method is the introduction of a pliable drain into the passage, either from above downward or from below upward, which has been in use in France for some time. The author describes his method. He first passes a hollow canula about the size of a No. 4 Bowman probe, through which passes a very delicate, flexible, silver bougie armed at the end with a silver knob of the diameter of the canula; with appropriate instrument this knob is pulled out as far as the external naris. A drain composed of several loops of silk (Fil d'Alsace) impregnated with iodoform, with extra superior and inferior loops, is drawn upwards into the lacrimal sac, but not as far as the superior canaliculus, the upper loop only making its exit, and being severed from the bougie. The inferior loop is placed in the naris. Daily lavage of the drain by injections into the lacrimal sac is necessary. The first drain consists of 6 to 8 threads, and should be left in situ for several days. Then it should be replaced by one of 10 to 12 and so on up to as high as 24. In this way a gradual painless dilatation of the passage is accomplished, while drainage is going on. The author describes several cases so treated with good result. He claims that his method is of advantage in cases where other forms of treatment have failed, where there is a stricture, in young children, and where a narcosis would be necessary otherwise. C. L.

The Relation Between Chronic Retrobulbar Neuritis and Arteriosclerosis.

Scalinci, Noe, Naples (Rapports entre la névrite rétro bulbaire chronique et l'artério-sclérose, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 225), claims that a condition of arteriosclerosis is almost always the basis of a chronic toxic neuritis. To support his contention he cites the histories of twenty patients who suffered simultaneously with toxic neuritis and general arteriosclerosis. The beneficial results of treatment are due, he explains, to the fact that the lesion of the cranial vessels is in its initial stage, and that the iodides, etc., free the vascular tissues from the toxins, allowing them to recover their normal function. A second attack, however, finds the field already prepared, and the danger is therefore greater. Strychnin probably acts by dilating the smaller vessels, allowing a better nutrition of the nerve. Four cases of atrophy of the optic nerve following retrobulbar neuritis are cited. In none was there a history of tobacco or alcohol, but in all a history of diffuse arteriosclerosis, so the author feels justified in assigning arteriosclerosis as the basis upon which develops an alcoholic or a nicotinic neuritis. C. L.

Two Cases of Recurring Intraocular Hemorrhages.

MOISSONNIER, Tours (Deux cas d'hémorrhagies intra-oculaires récidivantes des adolescents, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 240), states that the characteristics of this condition are four:

(1) The amount of blood, which may fill the vitreous and prevent examination.

(2) The frequency of the attack; several times in one year.

(3) The absence of all general complications.

(4) The spontaneous cessation of the diathesis.

One of the patients in the cases reported was 18 years old, the other 28, both males. In one case a buccal infection caused by bad teeth, whose extraction was followed by cessation of the hemorrhage, is supposed to have been the cause. In the other, antileutic treatment was beneficial. C. L.

Huge Physiologic Excavation of the Disk.

HILLION, H. (Vaste excavation physiologique de la papille, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 247), reports a case of bilateral excavation occupying practically the entire disk. There was no diminution of the visual acuity or the visual fields. C. L.

Iridocapsulectomy.

BOURGEOIS, A., Rheims (De l'irodocapsulectomie, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 273), uses this operation in cases of seclusio pupillæ where the lens is absent, and in thick secondary cataracts. He uses a socalled "broad needle," narrow and very sharp; a blunt Tyrel's hook, longer than the original and curved at the extremity; a de Wecker's scissors. After cocainization, the inferior border of the cornea is sectioned for 3-4 mm. by the needle, increasing the length, afterwards, if necessary. During the corneal incision a hole is made by the point of the needle in the iris as high as is desired.

By means of the hook caught in this hole, the iris is gently pulled out of the wound with the capsule, and as much excised as desired; it is then replaced. The operation is painful, but the cure is complete in four days. C. L.

Statistics of Foreign Bodies in the Cornea, Originating from the Patient's Occupation.

Lafon, Ch. (Etude statistique sur les corps étrangers professionnels de la cornée. *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 294), finds that the presence of foreign bodies in the cornea varies greatly, according to the occupation, from 23.7% in the case of mechanics to 0.4% in sheet iron workers. (A large group designated as sundries shows 17.5%, and this group includes 33 occupations, so the percentage of several in this group would probably be lower.) As to the nature of the foreign body, iron and steel come first with 197 cases or 65.7%. Emery is next with 44 cases or 14.7%, etc. The trauma is most frequent at the ages of 17 and 18 (117 and 119 cases respectively). From 20 to 40, though the individual years vary, the decades show about the same number of cases, from 85 to 40 a year, after which time the number rapidly decreases. Tables are given showing the number of cases each month, each day, and each hour. The left eye is more frequently affected than the right The following conclusions are drawn:

(1) The number of cases increase with the hours of work; is smallest in the morning and greatest in the late afternoon, varying with fatigue.

(2) The number increases from Sunday to Saturday, i. e., in proportion to the distance from the day of rest.

(3) The number increases with the rise of temperature, which on the other hand diminishes the power of resistance to fatigue.

(4) The number is inversely proportional to the age of the patient, being greater when he is young and more susceptible to fatigue. C. L.

The Treatment of Amblyopia Nicotina by Lecithin.

De Waele, Henri (Sur la médication de l'amblyopie nicotinique par la lécithine, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 308), found in the course of his studies that if an equimolecular quantity of lecithin was added to a toxic dose of an alkaloid, the action of the latter was neutralized or attenuated. From this he was led to attempt the cure of recent nicotinic amblyopia by the use of greater or less quantities of lecithin. He has treated four cases by a daily subcutaneous injection of 10 centigrams, and noticed a more rapid return of vision and color perception. C. L.

Oculo-Sympathetic Syndromes.

Beauvieux (Syndromes oculo-sympathiques, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 312) calls attention to their importance in general pathology. The entire syndrome may not be present in every case of paralysis or stimulation of the sympathetic; one or more symptoms may be lacking. He divides the lesions into (1) those at the origin of the nerve, (2) those along the path, (3) dysglandular, and (4) congenital and reflex. The histories of two cases are reported, one of a paralytic syndrome, due to compression of the globe by an hypertrophied ganglion, and the other of a unilateral, spasmodic, and regularly intermittent mydriasis. C. L.

Syphilitic Pericorneal Swelling.

Trantas (Bourrelet périkératique syphilitique, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 320) reports the case of a patient who in addition to a madarosis had a circumcorneal swelling in the form of an incomplete ring, caused by a thickening of the conjunctiva. The patient presented also a syphilitic eruption, and under local treatment with silver nitrate and general treatment with mercury, the ocular condition, which at first increased in severity, finally got well. C. L.

The Ocular Complications of the Recurrent Fever of Africa.

Coppez, H. (Les complications oculaires de la fièvre recurrente d'Afrique, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 353), has studied the eyes of Europeans who have lived in the Congo, especially those who have suffered from recurrent fever. The chief classic complication of the European type is an acute or chronic iridochorioiditis, which appears some weeks after the last attack of the fever. That of the African type is practically unknown. The author reports a case characterized by fine vitreal opacities, central scotoma and, later, a stubborn descemetitis. Although the Wassermann reaction was negative, and although mercury has been warned against in recurrent fever, a mercurial treatment completely cured the patient. C. L.

Bilateral Optic Neuritis, With Paresis of the Left VI Nerve.

Le Roux, H. (Névrite optique bilatérale, avec parésie de la VIe paire gauche, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 325), reports the case of a child four years of age, in whom, following vomiting, headache, insomnia, etc., a paralytic convergent strabismus and a double choked disk appeared. A diagnosis of tubercular meningitis was made, and under favorable climatic conditions and proper nourishment the whole trouble disappeared. C. L.

The Causes of Blindness in Infants.

Bednarski, A. (Les causes de cécite chez les enfants, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 356), found in the hospital for children at Lemberg 100 cases of bilateral and 200 cases of unilateral blindness, in 4,267 infants, as follows:

Cause.	Unilateral.	Bilateral.
Congenital diseases	23	2
Blenorrhagia	15	24
Keratitis phlycten., scrofula, tuberculosis	33	118
Measles	3	10
Scarlatina	4	3
Follicular enteritis	4	2
Pulmonary affection	1	1
Syphilis	1	0
Purpura of Werlhof	1	0
Meningitis and cranial affections	9	5
Trachoma	0	1
Myopia	1	0
Trauma	2	21
Neoplasm	0	5
Unknown	3	8
	100	200

A discussion of each form follows. Thirty-nine per cent of cases were in the first year of life, 30% in the second, third, and fourth years, and 31% in the fifth to eleventh year, inclusive. C. L.

The Pathogeny of Congenital Serous Cysts of the Iris.

Nadal, Rafael (Note sur la pathogénie des kystes séreux congénitaux de l'iris, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 363), reports a case of a boy of 11 years with a good antecedent history, in whose left eye a tumor developed at the age of one and one-half years. The boy suffered a blow on his head at the age of two years. About a year ago, the lad developed a very painful inflammation of the left eye, which was cured, but the tumor continued to develop, at times causing slight ocular pains and headaches. It was finally necessary to extirpate the tumor by an iridectomy, but it was ruptured in so doing. The operation was entirely successful and the patient was discharged with a vision of 0.6. In describing the sections of the tumor, special stress is laid on the fact that the epithelial covering was not in contact with the retinal layer of the iris. After discussing the various theories, the author offers as an explanation of idiopathic cyst the theory that at the time of the development of the lens, some epithelial cells became isolated and subsequently developed into a cyst.

C. L.

An Operation Table for Ocular Surgery.

Landolt, M. (Une table d'operations pour la chirurgie oculaire, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 390), describes and pictures a table specially devised for oculists. It consists of a stable support, of a fixed height, suitable to each operator, on which is a flat top, with a deep indentation on each side, near the head, at the height of the breast of the operator. The part of the top on which the shoulders of the patient rests can be raised to different heights and carries a plate for the head to rest on, which can be brought nearer to or further away from the shoulder rest. It can also be turned laterally, so as to turn the head in any direction. C. L.

Sclerectomy With Peripheral Iridal Excision.

Lagrange (De la sclérectomie avec boutonnière irienne périphérique, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 433) reviews the history of this operation. The iridectomy may be made with the knife at the time of the scleral incision or later with the scissors. The theoretic advantages are: (1)

the dangers of the usual iridectomy, in certain kinds of glaucoma; (2) conservation of the sphincter allowing the action of miotics; (3) good fistulization without iris incorporation; (4) absolute innocuousness of the operation. He considers the conditions favorable for this operation to be: (1) coinciding of the visual field with the point of fixation; (2) nervous state of the patient, predisposing to sudden loss of central vision; (3) tension varying from normal to T. + 2, with intermittence. C. L.

A Modification of Lagrange's Operation.

Coppez, H., Brussels (Sur une modification a l'operation de Lagrange, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 443), advocates a change in the technic of the Lagrange operation, which consists in the use of the lancet instead of the ordinary Graefe knife. It is to be preferred because there is a gradual instead of a sudden loss of aqueous, with the latter's frequently unpleasant sequelæ. A preliminary conjunctival flap must be made. C. L.

Simple Sclerectomy in Glaucoma.

Bettrémieux (La sclérectomie simple dans le glaucome, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 446) reports a few cases where he obtained good results by a simple pericorneal sclerectomy. He advocates it because it is a simpler operation, and can always be followed if necessary by a later sclerectomy with iridectomy. C. L.

A Case of Neurofibroma of the Lids.

Rohmer, Nancy (Un cas de neurofibrome des paupières, *Archives d'Ophtalmologie*, 1911, Vol. XXXI, p. 451) reports the history of a case which had been seen 23 years previously. It had been partially excised then, with the microscopic diagnosis of neurofibroma. The tumor had commenced to grow in the last eight years, and covered the entire right temple. An attempt was made to remove a portion of the tumor, but the hemorrhage was so great that it was necessary to stop the operation. Repeated, secondary hemorrhages, and death from bronchopneumonia and septicemia. Microscopically the tumor was found to be a neurofibroma. C. L.

Iridochorioiditis Following Gastro-Enteritis of Infants.

VILLARD, H., Montpellier (Irido-chorioidite consécutive a la gastro-enterites des jeunes enfants, *Archives d'Ophtalmologie,* 1911, Vol. XXXI, p. 461), reports two cases where a plastic iridochorioiditis followed a very severe gastroenteritis in children, one four months and the other three years old. The lesion was an insidious one, and occurred when the other condition was gravest. C. L.

A Case of Palpebral Autoplasty.

DAUTHUILE, A., Lille (Sur un cas d'autoplastie palpebrale: procédé opératoire; résultats, *Le Nord Médical,* 1910, Vol. 7, p. 242) describes an operation which he performed on a patient with a large palpebral coloboma, the result of an injury which he had suffered eleven years previously. It consists of detaching the free margin of the lid from its cicatricial attachment, moving it downwards, and closing the gap formed by sutures. C. L.

Cataract Extraction With Sliding of the Conjunctiva.

VAN LINT, Brussels (Opération de la cataracte avec glissement de la conjonctive, *La Clinique Ophtalmologique,* Vol. XVII, July, 1911, p. 338), proposes sliding a large conjunctival flap over the corneal wound in order to protect the eye against hernia of the iris with consequent infection. The eye is seized according to Angelucci's method, and the fixation forceps held in the right hand of the assistant, who, standing behind the patient's head, pulls the lower lid down with his left hand. The operator, standing on the patient's right, incises the conjunctiva along the upper half of the corneal limbus and detaches it upwards for eight to ten millimeters, as far as the forceps which is holding the eye by the tendon of the superior rectus. A silk suture is then introduced on either side, the lower insertion entering the conjunctiva near the limbus and issuing two millimeters lower, the upper insertion being about ten millimeters higher. When the sutures are tied the conjunctival flap will slide over the corneal wound and cover the upper quarter of the cornea.

After placing the sutures the operator takes the fixation forceps from the assistant and does the cataract extraction. The fixation forceps are then removed, the lids separated by the assistant, and the sutures tied. To avoid the formation of corneal ulcers the sutures are cut very close to the knots. A drop of oily eserin solution is instilled, and the eye bandaged. After forty-eight hours the bandage is removed and a drop of atropin instilled. The conjunctival sutures drop out after five to six days, and the conjunctival flap retracts slowly, so that it has left the cornea sometimes after forty-eight hours, sometimes in four to five days.

The sliding of the conjunctiva is a very easy operation, and is one of the best preventives of hernia of the iris and infection. The conjunctival flap, lying in front of the wound in its full extent, acts as a sort of pressure bandage, insuring coaptation of the lips of the wound and giving the iris a point of support. In one case in which the author had vainly tried to reduce a hernia of the iris with the spatula, he saw the iris resume its normal position the moment the second knot had been tied.

The role played by the conjunctival flap in preventing infection is easily understood when one considers the fact that the wound is thus shut off from the conjunctival sac with its numerous microbes. Even if the flap should have retracted after forty-eight hours the wound has by that time sufficiently closed to assume its own protection. M. W. F.

Iridectomy Versus Sclerectomy in Glaucoma.

Abadie, Paris (Iridectomie et sclérectomie dans le glaucome, *La Clinique Ophtalmologique*, Vol. XVII, July, 1911, p. 346), again takes the stand against simple sclerectomy or sclerectomy combined with iridectomy for the cure of glaucoma. Malignant glaucoma is very rare; the most benign form of glaucoma may, however, become malignant as a result of surgical intervention, or of the conditions under which said surgical intervention took place. The few regrettable disasters that Abadie experienced were due either to the malignant character of the case, or to mistakes of the operator or patient, and the last class were by far in the majority.

If the iris is seized several times, or roughly handled with the forceps, or drawn too far out of the corneal wound, either through the lack of skill on the part of the operator or the unruliness of the patient, the result will be disastrous. During the days following the operation the anterior chamber fails to reestablish itself, the lens pushed forward drags on the zonula and presses the iris against the cornea. It is, therefore, advisable to take precautions against undue fear on the part of the patient, and to give a general anesthetic when one has to deal with an oversensitive patient. Furthermore, whenever it is practicable the use of the lance knife is advised to hasten the reformation of the anterior chamber and to avoid the pressure of the pushed forward lens. None of these advantages accrue to the operation of sclerectomy. It is a difficult operation, producing a large gaping wound, into which the iris is apt to protrude, and necessitates a partial excision. The anterior chamber, having a large vent, reforms slowly, the lens is in apposition to the posterior surface of the cornea and drags on the zonula. Right here the disease may assume a malignant character, severe pains come on, and the loss of the eye is certain.

Abadie cites de Wecker's view to substantiate his own.

M. W. F.

Local Anesthesia for Enucleation.

Brunetière, Bordeaux (Notes sur la technique de l'anésthesie locale dans l'énucleation, *La Clinique Ophtalmologique,* Vol. XVII, July, 1911, p. 349), sounds a note of alarm concerning the number of deaths which have occurred as a result of general anesthesia induced in young people for the performance of eye operations of a lesser character, such as sclerotomy, discission of congenital cataract, iridectomy, etc. He condemns the routine use of a general anesthetic for enucleation, and maintains that local anesthesia is quite sufficient, provided one takes certain precautions. In spite of numerous recommendations, local anesthesia has not found favor in France, although Haab and Siegrist, in Switzerland, have used it with very satisfactory results. The slightly modified solution of Haab is the one which Brunetière prefers; it reads as follows:

Cocain hydrochlorate	0.15
Eucain	0.20
Adrenalin 1/1,000	m.V
Water	10.00

The solution is freshly prepared with water boiled in a sterile bottle. A graduated glass syringe holding 2 cc., armed with a long needle, is used for injecting 0.25 cc. around the tendon of each of the recti muscles, the conjunctival sac having been previously well anesthetized with the same solution. After a wait of eight to ten minutes the conjunctiva is incised and the muscles detached. The important point is that the muscles must not be dragged upon when loading them on the strabismus hook, as that is what causes pain; a better way is to seize the tendon of each muscle with the forceps and dissect it away from the sclera. In spite of the use of adrenalin there is apt to be profuse hemorrhage after detaching the muscles.

Following the sclera with the needle 0.50 cc. of the solution is injected around the posterior pole of the eye, and five minutes later the eye is removed, the cutting of the optic nerve being done with a single cut, if possible. A tampon impregnated with oxygenated water is introduced into the cavity, and pressure applied. After the operation the patient is kept in a horizontal position for several hours and alcoholized coffee administered. M. W. F.

A Helpful Hint in Probing Severe Scrictures of the Lacrimal Apparatus.

Armaignac, Bordeaux (Un moyen simple pour faciliter le cathéterisme des voies lacrymales dans les cas de retrécissement très prononce, *La Clinique Ophtalmologique*, Vol. XVII, July, 1911, p. 356), stands for the conservative treatment of the affections of the lacrimal apparatus. In over thirty years he has not incised a lacrimal point, and yet he has been able to cure a large number of cases of tearing, dacryocystitis, and lacrimal fistulæ, some of them of many years' standing, often in a few weeks' time, by passing probes through the uncut puncta. "Too many tear sacs are mutilated." Only after exhausting conservative treatment should surgical procedures be resorted to, and these, unfortunately, fail to bring relief in the majority of cases.

Probing is sometimes very difficult on account of the extreme stricture of the internal mouth of the canaliculus or of the nasal duct. Sometimes fungous excrescences of the sac make the finding of the upper end of the nasal duct almost impossible, or the probe passes through a carious spot in the bony walls of the sac, giving rise to the much feared "false passage." Very small probes are very apt to produce these false passages. Armaignac starts with his No. 6, which is about the same caliber as Bowman's No. 3. His probes have a blunt olive point, which informs the operator much more of a resistance encountered and passed than a cylindrical probe would.

Even in simple stenosis cases, when water forced through the lacrimal point can be made to reappear in the nose, a well oiled probe is passed with difficulty because the walls of the canal strip the lubricant from the probe. To overcome this Armaignac has made use of a principle used in mechanics, namely, the oil bath, or automatic lubrication. Three or four drops of sterile olive oil, the best lubricant for this purpose, are forced through the lacrimal point under pressure sufficient to make it reappear in the nose. The effect of this injection of oil is often surprising; strictures that seemed impassable now allow the probe to pass with surprising freedom and without bruising the walls of the canals, and probes one or two numbers thicker can be passed, the pain of the probing being much lessened or entirely suppressed. M. W. F.

Two Cases of Myopia Due to Traumatic Forward Displacement of the Lens.

Fromaget, Bordeaux (Deux cas de myopie traumatique par avancement du crystallin, *La Clinique Ophtalmologique*, Vol. XVII, July, 1911, p. 359), gives the history of two cases of traumatic myopia, which are worthy of a somewhat lengthier excerpt.

A woman aged 39 struck herself in the right eye with the lash of a whip. The eye had good vision prior to the accident. A small hematoma in the upper lid proved that the lash had struck the lid and not the globe itself. Pain in the eye with brow-ache came on at once. The patient applied a pressure bandage, and on removing this a few hours later the bulbar conjunctiva was suffused with blood, and nearby objects could not be distinguished. The cloud in front of her eye cleared up in a few days, and had disappeared at the end of a fortnight, but the patient now had the sensation of looking through glasses that were much too strong. This sensation was so disturbing that the patient even had attacks of vertigo from it, to overcome which she surpressed the images of the right eye.

At the first examination of the eye, a fortnight after the accident, no trace of the hematoma of the lid was seen, and a slight yellowish discoloration of the bulbar conjunctiva was all that remained of the subconjunctival effusion. The first thing to attract attention was the complete disappearance of the anterior chamber, iris and anterior lens surface being crowded against the posterior corneal surface. Oblique illumination showed a very mild descemetitis in the lower part of the pupillary area and some very thin synechiæ. The right pupil is dilated to 5 millimeters, the left pupil being 3½ millimeters, and reacts well, although somewhat slower than the left pupil, to direct and indirect stimuli. The range of accommodation is two diopters on the right, five on the left. Vision, unaided, of right is 1/10; with a — 3.50 lens, normal. No tremulous iris. Tension, — 1.5. External muscles intact. The feeling of vertigo disappeared as soon as the correcting lens was placed in front of the right eye, and reappeared as soon as this lens was removed. The media and fundus of the eye were normal, and a slight astigmatism, according to rule, of 0.5 D. was present.

The patient made weekly visits to the clinic for two months, during which time the only change noted was the disappearance of the descemetitis. The myopia and hypotonia persisted. Nine months later she was recalled, and stated that her menses, which had stopped for three months after the accident, had reappeared, and that since then she had noticed a distinct improvement in her vision, and was unable to wear the concave lens. Fromaget hoped to find the right eye had returned to normal conditions, but was surprised to find the lens still clear and pushed hard against the cornea, and the anterior chamber still absent. The pupil has now the same diameter and mobility as its fellow. The vision is 0.8 with + 1.50. The tension seems lower than before, about — 2.0. The range of accommodation has become = 0, and a lens of + 4.5 is necessary to enable the patient to read at 33 centimeters. The corneal curvature is 7 on the right eye, 7.6 on the left.

The vertigo was due to the difference in size and distinctness of the retinal images, and disappeared as soon as these images were made the same in size (?) and distinctness by correcting the right eye.

As the ciliary function was almost wholly suspended, the myopia must have been caused by the forward displacement of the lens. One of the main components of the dioptric power of the eye is the distance between the posterior surface of the cornea and the principal plane of the lens, which is normally 5.97 mm. By displacing the lens forward 3 mm. the eye has assumed a dioptric power of 47.3, corresponding to a focal distance of 21.1 mm. In the normal eye the posterior focus is 22.5 mm. behind the cornea, which leaves the posterior focus in our traumatized eye 1.4 mm. in front of the retina. As 0.3 mm. corresponds to one diopter, we have thus a myopia of 4.6 accounted for. As the myopia amounted to 3.5 only, Fromaget accounts for the difference by assuming that the posterior pole of the eye advanced also, as is customary in eyes with hypotonus. There was also a slight increase in the corneal curvature.

As to the cause of this traumatic ophthalmalacia, Fromaget believes it is due to the diminished secretion of aqueous, as there was no vent from the globe to explain the abolition of the anterior chamber, as it is seen when the globe has been opened or the aqueous escapes through a fistula.

To explain the change from myopia to hypermetropia, Fromaget assumes that in every eye in which hypotonia has existed for a long time there is a general diminution in the size of the globe. As the equatorial diameter participates in this shrinking the lens moves forward, a phenomenon which may be observed in eyes which are affected with phthisis after uveitis. The anteroposterior axis is shortened, and a shortening of 1.5 mm. is sufficient to change a myopia of 3.50 diopters into a hypermetropia of 1.50 diopters.

The second case reported by Fromaget had a happier outcome. Two days before his first visit his right eyelid was pierced by a hatpin in the middle of the orbitopalpebral furrow. There was a sudden sharp pain, and on separating the lids a few moments later he noticed that his vision was much diminished, and that he seemed to see through a cloud.

Tension was — 2, slight pericorneal injection; mild ciliary pain, anterior chamber absent, pupil slightly contracted, iris projected forward and resembling in appearance a truncated cone. No lesion visible in the fundus. The vision reduced to less than 1/10; with — 4 O. D. = 2/3. The wound being behind the fornix conjunctivæ is not visible, but its position is indicated by a slight subconjunctival ecchymosis.

Four days later the tension was — 1.0, and the vision 2/3 with — 0.25 D. Two weeks after the accident the conditions were again normal, and the vision was 2/3 without correction. The patient was dismissed as cured. M. W. F.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

William H. Crisp, M. D.,

Denver.

Orbital Sarcoma Held in Check by Cinnamate of Soda.

Fernandez, J., Santos, Havana (*Archivos de Oftalmologia,* March, 1911). The author is now able to report the microscopic finding in a case the clinical aspects of which were published in 1908. The enucleation of an eye which had been blind for ten years was followed by abundant granulations, which gave rise to a suspicion of melanosarcoma. This condition subsided after repeated cauterization. Nine years later the lids were protruded by an orbital tumor. This became much reduced in size after series of injections of a solution of cinnamate of soda, and a year later the patient's condition was reported as perfect. After further two years, however, the tumor again projected between the lids. Death shortly occurred from intestinal obstruction. Histologic study showed the tumor to be melanosarcoma.

Subretinal Cysticercus.

Balbuena, F., Gijon (*Archivos de Oftalmologia,* May, 1911). A girl of 18 years complained of gradual obscuration of vision. With the ophthalmoscope the cysticercus was seen in the macular region. It was traversed by the retinal vessels, and its size was horizontally about four, vertically about two disk diameters; the appendix, obliquely placed, measured three disk diameters in length. The diagnosis was confirmed by expulsion per rectum of a tenia. Surgical intervention being refused, a subconjunctival injection of 1 cc. of pelletierin (1.500 solution) was given. In the course of the next two days the scolex penetrated the retina and came well forward into the vitreous. After this, without pain or inflammatory reaction, the media became cloudy. After some further injections of pelletierin the patient disappeared for eight months, and then returned with inflammatory symptoms, for which the eye was enucleated. The cysticercus was found encysted in the vitreous, and there was a large area of retinal detachment.

Hemeralopia in Pregnancy and Lactation.

Del Mazo, J. G., Madrid (*Archivos de Oftalmologia*, March, 1911). The two cases recorded are the only ones in a total of 20.000 patients of the Ophthalmic Institute of Madrid. The first patient was a woman of 21 years, with a history of two normal pregnancies and labors. During each lactation she suffered hemeralopia. In the second patient, 25 years old, and mother of four children, hemeralopia had begun at the seventh month of each pregnancy, and each time ended during the puerperium. With the last child, however, the hemeralopia reappeared six weeks after childbirth, to continue until weaning.

Treatment of Optic Neuritis by Lumbar Puncture.

Vazquez, I. V., Mexico (*Anales de Oftalmologia*, March, 1911). Two cases thus treated are described by the writer. Both were of retrobulbar neuritis. In the first, vision of both eyes had been completely lost in six days. Under medical treatment there was but slight improvement, and that only in one eye. A marked improvement occurred within 20 minutes after lumbar puncture. Further improvement followed a second puncture, and vision finally returned to normal. The second case was also much benefited. Both patients experienced some disturbances (headache, lumbo-sacral pains, weakness of the limbs) for several days after the puncture.

The Eye of Gammarus Coecus, a Cave Crustacean.

Menacho, M. Barcelona (*Archivos de Oftalmologia*, January, 1911). In a lake in a cave on the island of Mallorca are found blind crustaceans of the Gammarus family. The lake, although probably connected with the sea at a remote period, has no such connection at the present time. The eye of gammarus cœcus, which is compound, shows an absence of pigment, although this is present in its seeing relative. The crystalline cone is greatly atrophied, as is also the proximal portion of the retinula. There is no apparent atrophy either of the peripheral optic ganglion or of the cerebral ganglion.

Amaurosis from Intestinal Worms; Recovery.

MEGIA, Madrid (*Archivos de Oftalmologia,* March, 1911). The patient, a boy of six years, had light perception only. Gradual loss of vision had begun six or seven months previously, and had coincided with slight convulsions, loss of appetite, disturbed slumber and general nervous instability. Ophthalmoscopically all that could be discovered was marked mydriasis, slight retinochorioidal congestion, and a disk not far from normal. After the expulsion of large quantities of lumbricoid worms the vision rapidly improved, until at the end of four months it was 4/5 of normal.

Ocular Complications of Leprosy.

FERNANDEZ, F. M., Havana (*Anales de Oftalmologia,* March, 1911). The paper is based on the author's experience in the San Lazaro Hospital of Havana. All leprous patients sooner or later lose their eyelashes and eyebrows. Ulceration and necrosis of the palpebral tissues often result in ectropion or entropion. In some cases observed, obstruction of the lacrimal passages has occurred, with occasionally destruction of the puncta lacrimalia. There is often leproma of the conjunctiva. The most frequent ocular lesions are keratitis and iritis. The former begins usually by extension from the sclera on to one quadrant of the cornea, gradually involves the whole cornea, causes great pain, and finally results in complete leucoma. The excessive pain of leprous iritis does not settle down into a state of chronic irritation, but continues to be acute over a long period. Affections of the retina and chorioid are uncommon. In advanced cases the lens may become opaque and atrophied.

Complete Optic Atrophy from Shot Wound of Nerve Behind Eyeball.

FERNANDEZ, F. M., Havana (*Anales de Oftalmologia,* March, 1911). A man of 32 years received at close range a bullet which passed from above downward behind the globe, lodging in the left superior maxillary bone. There was marked palpebral and periorbital edema, but the patient was dismissed from the hospital, a few days after the accident, in good condition. A month later the disk of this eye showed atrophy, the retinal veins were full and tortuous, and vision was completely lost.

SOCIETY PROCEEDINGS.

BY

T. B. Holloway, M. D.,

PHILADELPHIA.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of April 17, 1911. Dr. H. W. Woodruff, presiding.

A Case of Sympathetic Ophthalmitis First Appearing Four Days After Removal of the Exciting Eye, With Histological Report.

Dr. Carroll B. Welton of Peoria reported the case history of a carpenter, aged 35, who was struck in the left eye by a large nail which penetrated the globe. The iris was prolapsed into the wound, the anterior chamber was full of blood, and vitreous was seen at the wound entrance, but only a small quantity had escaped. Vision, finger counting at 2 feet. Fellow eye normal. The patient refused enucleation. The iris fragments were snipped off, and at the end of ten days the wound had closed. Light projection at this time was faulty. The fellow eye had 20/20 vision, with normal range of accommodation. Advice to have the injured eye removed on account of possibility of sympathetic involvement was finally heeded and the eye removed on the thirtieth day. The fellow eye was normal as to vision and accommodative power.

Four days after enucleation, sympathetic disease manifested itself by slight pain, reduction of vision to 20/40, photophobia and recession of accommodative power at near work. The iris dilated only partially under atropin, media faintly clear. In the chorioid, many nodes of a whitish yellow color were present. The patient was immediately put to bed and given sodium salicylate. The next morning precipitates were present on Descemet's membrane. A mesh of new blood vessels was present over the surface of the iris. The patient improved under treatment, and in ten days salicylates were stopped and he was discharged from the hospital three weeks later.

Three months after the time of the injury vision was 20/20. Histological examination of the injured eye shows a marked proliferative uveitis of the type described by Fuchs.

Abstracts from the literature of twenty-seven cases of this post-operative type of sympathetic disease were given. Time of onset, in this form of the disease, is within a month following enucleation; 59% recovered with normal vision.

From a study of these cases Dr. Welton concludes that the infectious agent is carried to the fellow eye by the general circulation.

Dr. H. W. Woodruff thought that it might be possible to discover the symptoms of early transference in the sympathizing eye by careful examinations made from day to day so as to be on the alert for the first manifestations of sympathetic trouble developing.

Dr. L. N. Grosvenor suggested that in all such cases it is advisable to keep a record in the nature of a drawing of the fundus. This would offer a very practical and conclusive basis of comparison from time to time in observing such a case.

A Case Presenting Symptoms of Trachoma, Vernal Catarrh, and Follicular Conjunctivitis.

Dr. Clifford E. Smith presented E. S., female, age 14, from the service of Dr. Willis O. Nance at the Eye and Ear Infirmary, who came from Southern Illinois, accompanied by a little sister, who gives the same history and shows the same findings.

The patient dates her trouble to measles three years ago, but active trouble seems to have developed two months ago. The eyes have smarted more or less, but the lids have never been inflamed or stuck together in the morning. Vision in each eye is 20/20, and there is no pannus. The conjunctivæ of the lids and the fornices are thickly studded with flat-topped sessile follicles varying from 1 to 2 mm. in diameter. The conjunctiva between the follicles is not infiltrated, the entire area presenting a pinkish-white appearance, rather than one of inflammation. The ocular conjunctiva presents the normal white appearance. There is no drooping of either upper lid.

Summary.—(1) In trachoma of this duration, we would expect some pannus, and inasmuch as trachoma is a contagious inflammatory disease, we would expect to find in any case more signs of inflammation, with more or less discharge, which is not present here.

(2) In vernal catarrh we would expect to find a more milky-white appearance of the conjunctiva. In this case there is a suggestion of the "cobble-stone appearance" described by Fuchs, and we have the history that the present attack came on in the early spring. No eosinophiles were found in this case.

(3) In follicular conjunctivitis we often get such an appearance with very few signs of inflammation. As a rule, however, the upper lid conjunctiva is not so extensively involved, and in most cases the duration is shorter.

Dr. T. A. Woodruff was of the opinion that the case was one of trachoma and if it had occurred in private practice would have treated it as such.

Dr. H. W. Woodruff called attention to the facial expression of the patient as being "typically trachomatous," an expression almost always exhibited by a patient who has had trachoma. In all cases of this character laboratory findings are usually negative, therefore it is necessary to take into consideration the clinical manifestations, and of these clinical manifestations the ptosis is the distinguishing and almost constant symptom.

Dr. Thomas Faith suggested expression and the subsequent behavior of the lids as a means of differential diagnosis between trachoma and vernal catarrh.

Dr. W. A. Barr said that this patient has a younger sister in Dr. Beard's service at the Illinois Eye and Ear Infirmary, suffering from apparently the same disease. It is evident that more than one member of the family is afflicted with the malady. The indication from the history sheet as well as the clinical picture, is trachoma. The younger sister has been much improved by expression of the granules.

Symposium on Diseases of the Nasal Accessory Sinuses and Their Relationship to Diseases of the Eye.

THE RATIONALE BASED ON SURGICAL PATHOLOGY.

Dr. Joseph C. Beck presented this feature of the subject. He said that the pathological anatomy of the nasal accessory sinuses explains most of the symptoms referred to the eyes, and the further study of the surgical pathology can in most instances verify the cause of these symptoms. The positive results from surgical treatment of these accessory cavities is still another proof of the rational relationship that exists between the nose and the eyes.

He referred to the acute fulminant type of sinusitis in which either perforation or thrombosis has taken place with secondary infection of the orbital contents. This condition is most frequently secondary to an acute rhinitis and simple sinusitis, frequently in cases of pre-existing chronic sinus diseases. In cases which have developed in a pre-existing chronic sinusitis one will find chronic granuloma and polypi, or even old necrotic areas.

The bacteriological examinations of the secretion show many varieties of microorganisms; the staphylococcus, micrococcus catarrhalis, streptococcus, pneumococcus and bacillus influenza are found. Besides, many of nonpathogenic variety are present.

In chronic forms of sinusitis we find a larger number of ocular symptoms and diseases caused by the said affection, without the patient recognizing that there is anything very much the matter with his nose. In chronic suppurative sinusitis the middle turbinate body is in a true state of hypertrophy. The ethmoidal cells break down easily under the pressure of a curet. The pus is of a thick consistency and may or may not have odor, depending on the extent of retention and bony necrosis; also whether we have the specific microorganism present of fetid ozena.

In chronic nonsuppurative sinusitis the middle turbinal is somewhat enlarged, especially anteriorly, and this has often the appearance of a polypus. The bone may be large because of rarefaction, and can easily be cut off or mashed. There are areas of polypoid degeneration on its under or outer surface. When the polypi are present, and they are usually present, hidden early, and very manifest later, they are soft and more grayish in appearance. The ethmoidal cells are usually distended with polypi and many partitions are destroyed by pressure. Since the other sinuses, frontal, antrum and sphenoid, are seldom opened in this condition, the pathology is not well known, except from postmortem examination, and then the changes are found practically the same, except not so marked as in the ethmoid. This affection may be called chronic nonsuppurative ethmoiditis rather than sinusitis.

These changes will very well explain symptoms of referred irritation in sensory and motor nerves, which cause ocular symptoms. The same is true in the suppurative form, but the pressure is not as great, as a rule. The chronic suppurative process can extend to the orbital structures also by continuity of tissue, causing inflammation of the nerves, muscles, etc. Both suppurative and nonsuppurative forms will obstruct the circulation and explain symptoms caused by these vascular changes.

ANATOMIC AND PHYSIOLOGIC RELATION BETWEEN THE EYE AND THE NOSE.

Dr. A. H. Andrews discussed the anatomic and physiologic relation between the eye and the nose under four heads. (1) The relation of the orbit to the bony walls of the nose and its accessory cavities. (2) The relation of the optic nerve to the accessory cavities. (3) The relation of the circulation of blood in the orbit and the blood vessels in the nose and accessory cavities. (4) The relation between the nerve supply of the two parts.

The orbit is one-half to three-fourths surrounded by the bony cavities connected with the nose. It is not strange that diseases of these cavities should seriously affect the ocular structures.

The thickness of the bony wall between the orbit and the nasal cavities varies to a considerable extent. There are sometimes dehiscences. The wall may be very thin or the bony plate may be thick and strong. In very thick skulls there seems to be a corresponding thickness of the naso-orbital walls, although exceptions are sometimes seen.

The bony plate lying between the sphenoid cavity and the optic foramen varies in thickness from ½ mm. to 2 mm.

The optic nerve, lying as it does in close proximity to these cavities, is especially liable to become involved. This is in part accounted for by the fact that the so-called optic nerve is not really a nerve at all, but a central intercerebral cord (Spalteholz), having coverings the same as the brain and spinal cord. The highly specialized function of this tract makes it more susceptible to disturbing influences around it. The absence of sensation makes disease of this tract insidious.

DIAGNOSIS OF ASSOCIATED DISEASES OF THE EYE AND NASAL ACCESSORY SINUSES.

Dr. Frank Brawley declared that the close relation of nasal to ocular disease becomes more apparent as we learn to look for the important diagnostic points.

Asthenopic symptoms due to sinus disease are usually reflex in nature, but may also be due to a toxic process or to stasis in the orbital circulation resulting from the circulatory disturbances within the diseased sinuses.

All varieties of visual field anomalies have been ascribed to sinus disease, but the most valuable findings are central and paracentral scotomata and enlargement of the blind spot.

The eyelids may show edema as a result of frontal or anterior ethmoidal infection, and this tends to lessen as drainage is established, being less at night than in the morning.

Van der Hoeve has found enlargement of the blind spot, which he calls peripapillary scotoma, to be one of the earliest symptoms of the disease of the posterior accessory sinuses.

If at the first appearance of the lid edema the sinuses are investigated and proper drainage established, it would rarely be necessary to do the radical operations about the orbit, and the safety of the globe would be assured.

As improvements in diagnostic methods, such as the X-ray and the vacuum apparatus, make early diagnosis of sinus disease possible, we are more frequently detecting its influence upon the ocular structures. We are also finding that the ethmoidal and sphenoidal cells are much more frequently diseased than we formerly believed and that they act much more frequently as the source of the ocular disease than the frontal or maxillary sinuses, which doubtless owe their past prominence in this respect to their greater accessibility.

Discussion.—Dr. Faith recalled a case of nonsuppurative sinus disease in a patient, which later became of a suppurative type. The case presented many difficulties in diagnosis. A one-sided orbital cellulitis developed, the globe became infected and the eye was later removed. A later examination showed polypi in the nose and frontal sinus. Another case in his experience was diagnosed as a cyst of the lacrimal sac, which was later found to be a purulent process communicating with the ethmoidal bulla.

Dr. Lewis asked for information regarding a case of an amblyopic eye. Examination showed diseased tonsils, adenoids and a mucopurulent discharge from the nose. In four or five years the vision was reduced from 30/40 to 30/100. No fundus lesion or demonstrable ocular involvement. The doctor desired an opinion as to the possible cause of the reduction of vision.

Dr. H. W. Woodruff reported the case-history of a patient who consulted a rhinologist who advised operation on the nose for the relief of eye trouble which was an optic neuritis. Later the oculist found astigmatism, and, this being attended to, the eye condition cleared up. He found more difficulty in the recognition and treatment of the nonsuppurative conditions than in those of the suppurative variety.

Dr. A. H. Andrews, in closing, said that when a patient has headache, etc., and the fitting of glasses relieves the trouble, the thanks are unreservedly given to the oculist for the relief of the condition, and, vice versa, if a rhinologist is consulted for the headache and relief is obtained, the rhinologist receives the thanks of the patient. He emphasized the advantages of the pressure test and the use of cocain in the diagnosis of many of the annoying conditions of the nose which might be productive of ocular mischief.

Dr. Jos. Beck, in closing, agreed with Dr. Woodruff, that the nonsuppurative conditions were the most difficult to diagnose. He emphasized the importance of always examining tissues themselves and usually some changes will be observed. The X-ray is of no value in the diagnosis of sphenoidal conditions; the sphenoidal sinus, however, in his experience, has been the most frequent source of trouble.

Dr. Frank Brawley, in closing, called attention to the fact that this class of cases is best treated by those who take into consideration the co-relation of the nose, throat and eye. The study of the fields of vision is essential and of much value in establishing a diagnosis.

Willis O. Nance, *Secretary.*

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of April 15, 1911. Dr. Edward Jackson presiding.

Diabetic Cataract.

Dr. D. A. Strickler presented a lady 63 years of age who gave a history of diabetes mellitus of at least eleven years' standing. In May, 1900, her refraction was O. D. + 1.75 sph. ⊃ + 1.00 cyl. ax. 130° = 20/20; O. S. + 1.75 sph. ⊃ + 1.00 cyl. ax. 45° = 20/20. Dr. Jackson saw the patient in June, 1904, and refracted her. On March 17, 1911, refraction showed O. D. + 0.50 cyl. ax. 135° = 20/50; O. S. + 1.00 sph. = 20/50; there being a marked diminution of the hyperopia. The lens shows opaque striæ, and there is a peculiar play of shadows in the lens substance indicating undoubted nutritional changes. The urine continues to be heavily laden with sugar. The patient is dieting.

Dr. Strickler's query was: Does the present disturbance with diminished vision presage a rapidly forming cataract?

Discussion.—Dr. Jackson had seen this patient seven years ago. At that time "some cortical opacity with faint striæ, largely in the posterior cortex," was noted. The striæ are about the same at the present time as then. The correcting lenses, O. D. + 2. sph. ⊃ + 0.75 cyl. axis 135° and O. S. + 2. sph., then gave vision of 4/4 partly in each eye. Dr. Bull's statistics on cataract operation did not indicate that operation in diabetic cataracts was contraindicated. The per cent of successful results was not much less than in senile cataract. Many elderly people carry partial cataracts that show little change over long periods. Nine years ago he had seen a woman, then aged 65, who had been told several years before that she had cataract. At that time there was general haziness of the lens, with a few spicules or striæ of definite capacity. With correcting lenses her vision was then 4/8 mostly and 4/6 partly. Within the last week this patient had been seen again. There were still fine spicules and dots of definite opacity; but the haziness of other parts of the lens was gone, and with correcting lenses vision was 4/6 partly. The convex spheres required, however, had risen from + 1.50 sph. to + 2.50 sph. and from + 0.50 sph. to + 1.50 sph. D. There was no diabetes in this case.

Dr. Friedman did not think the diabetic cataract would mature.

Dr. Sedwick suggested the use of trypsin.

Dr. Black was of the opinion that there had been a rapid swelling of the lens, and, in view of that, thought the prognosis bad.

Dr. Hess reported operation on one case with unsatisfactory results.

Dr. Ringle would endeavor to control the degree of glycosuria in the hope that the condition would be retarded.

Dr. Bane thought a great deal depended on vigorous constitutional treatment.

Dr. McGruder was impressed by the arrangement of the opaque striæ; they did not have a stellate appearance and looked more like the dried wing of a fly.

Multiple Cysts of the Caruncle.

Dr. H. R. Stilwill presented a child six months old with several small cysts in the region of the caruncle. They were of two or three weeks' standing and were accompanied by some conjunctivitis. The conjunctival trouble had cleared up under argyrol, but the cysts persisted. They appeared to contain a clear serous fluid.

Discussion.—Dr. Libby had had a similar case in which they appeared suddenly and disappeared in the same manner, not requiring operative interference. If these persisted he would incise and cauterize.

Dr. McGruder reported the history of a child in which there was a spontaneous cure. He thought the cysts would disappear in this case.

Acute Glaucoma Relieved by Injections of Sodium Citrate.

Dr. W. A. Sedwick reported the history of a man of 57 who was struck in the left eye with a stick when 14 years of age, and traumatic cataract resulted. The eye had never given him any trouble until last December 17, 1910. The patient was suffering from acute glaucoma with the characteristic symptoms. The attack had come on suddenly and was accompanied by almost continuous vomiting. Tension + 2. Miotics were instilled, but gave no relief, and an iridectomy was made. The patient felt more comfortable after the operation and the tension diminished. Later in the same day pain returned and continued. The following day a paracentesis was made, followed by hot applications. Twenty-four hours later pain became so severe that the patient demanded enucleation of the eye. At this time the cornea was hazy, anterior chamber shallow. Tension + 2. Under cocaine anesthesia he injected, subconjunctively, 12 minims of a 4.05% solution sodium citrate, as recommended by Drs. Thomas and Fischer of Oakland, California, on the theory that this salt reduces the affinity of the tissue colloids for water, which in glaucoma has been increased through chemical changes in the tissues themselves. The injection was followed by intense pain, which lasted about ten minutes. Cocaine and hot applications failed to relieve it. In one-half hour the eye felt quite comfortable, and tension was found to be markedly diminished. Testing the tension, however, gave considerable pain. Six days after the injection, tension was normal, cornea clear, and anterior chamber of normal depth. Covering a period of two months the patient had four subacute attacks, each one of which was marked by intense pain and increased tension, the latter at one time rising to + 3. Injections of 12 minims of 4.05% solution sodium citrate were given each time and pain was always controlled, and tension fell in a few hours. Nearly two months have elapsed since the last attack, and at the present time the patient has no pain, tension is normal and all congestion has disappeared. Eight cases in which this treatment has been used have been reported: 5 by Thomas and Fischer of Oakland, California, and 3 by Heiler of New York. Good results were obtained in each case. The injections seem very painful—at least this patient would not submit to any more except under general anesthesia (somnoform).

Discussion.—Dr. Black suggested quinine and urea hydrochloride as a local anesthetic. He had never had experience with it himself and was not familiar with its effect on the eye.

Dr. Sisson had seen the case with Dr. Sedwick several times and had been especially impressed with the marked diminution of tension which followed each injection. He thought the patient a very nervous type, and, taking this into consideration, was of the opinion that other patients might not suffer so much from the injection.

Dr. Strader reported that the patient with hemorrhagic neuroretinitis, which he presented to the Society at the February meeting, had since died. Diagnosis: Cerebral syphilis.

Demonstration of the Trachoma Bodies.

Dr. E. O. Sisson, through the courtesy of Dr. Hanford McKee, of Montreal, demonstrated the trachoma bodies in a smear preparation and reviewed McKee's and Noguchi's exhaustive researches on the subject.

Discussion.—Dr. Jackson spoke of the work of the various investigators and thought the significance of the granules composing the so-called trachoma bodies was far from being settled.

Instruction in Ophthalmology.

Dr. Jackson spoke at length on the need of additional instruction in ophthalmology in our Medical Schools and Universities, and referred to the course recenty adopted by the University of Oxford, England. He presented the following resolution, which was unanimously adopted by the Society:

Whereas, A thorough preparation for ophthalmic practice requires the study of certain branches not demanded of the candidate for the degree of Doctor of Medicine; and,

Whereas, No complete, systematic course of instruction in ophthalmology is now offered in this country;

Resolved, That the Colorado Ophthalmological Society request the dean of the medical department, the president of the university and the regents of the University of Colorado to establish in the medical department of the university a course in ophthalmology, requiring: graduation in medicine, study of physical and physiologic optics, and one year of post-graduate work in ophthalmic science and practice.

The following officers were elected for the ensuing year: Secretary, Dr. Ellet O. Sisson, Denver; treasurer, Dr. Melville Black, Denver; chairman Executive Committee, Dr. E. R. Neeper, Colorado Springs.

Ellet O. Sisson, *Secretary.*

OPHTHALMIC SECTION

ST. LOUIS MEDICAL SOCIETY.

Meeting of May 3, 1911. Dr. M. H. Post, presiding.

Treatment of Trachoma.

Dr. F. P. Parker in outlining the treatment for trachoma stated that we should not be content with examination of the diseased eye alone, but should thoroughly acquaint ourselves with the social and occupational surroundings of the patient, his habits, mode of living and individuality; in other words, we should treat the patient as a whole.

Observation should include the location and limitation of the follicles, the contour of the lashes and lacrimal apparatus, and whether the disease has or has not previously been treated; also tuberculous and scrofulous conditions must be looked for, and the age of the patient considered, since the young respond more readily to treatment than do the old. The diet should be regulated, making it wholesome and nutritious, but not too stimulating. Great difficulty is encountered in prophylactic treatment because of the important social question involved.

The services of the school teacher, clergy, and health department can combine most usefully with those of the physician in the work of education.

The effectiveness of proper preventive measures is shown in the statistics of trachoma in the Prussian Army, where the number of cases was reduced from 3,200 in 100,000 troops in 1867 to 110 cases in 100,000 troops in 1895.

The city of London has a trachoma school, where children affected with this disease are sent and given an opportunity to learn hygiene, along with their other studies, while under treatment.

The drops most frequently employed are caustic, astringent and antiseptic. Not only should the dropper be thoroughly aseptic, but the hands of the physician as well, and great care should be exercised that every part of the conjunctiva be reached by the medicament. Douching will be found of value in cleansing the conjunctiva from mucus and pus, and gives much comfort to the patient, an important point where, as in this disease, long continued treatment is necessary. Great care should be used in not having the douche too strong.

The medicaments most frequently employed in the douche are boracic acid, bichloride of mercury, and normal saline solution.

I have found 1 to 10,000 permanganate of potash solution very beneficial. Direct applications of the camel's-hair brush and cotton applicators have their place; solution of silver nitrate often being used in this way. Considerable skill is required in its proper application, since it is not only necessary to touch the palpebral conjunctiva, but the retrotarsal folds as well. It should never be permitted to come in contact with the cornea, but should be flushed with saline solution before restoring the lid to its normal position. Cold compresses are valuable in reducing swelling, congestion and irritation. In case of pannus with secondary iritis, warm or hot applications are preferable. Boracic acid, lead, opium, chamomile, hops and tea leaves have all had their advocates in the form of compresses of various kinds.

The salves containing protargol, ichthyol, boracic acid, iodoform, xeroform and copper sulphate have been used.

The use of radium and the X-ray is of doubtful value. The surgical treatment of trachoma consists pre-eminently in the mechanical removal of the trachoma follicles, and may be accomplished by various methods. The ancients effected this purpose by means of scarifying the trachomatous lids with fig leaves. Later this work was performed by using sharp pointed sticks, sharp curette, or the thumb nail. Some contend that each individual follicle should be separately opened and expressed, though, according to Fuchs, this is not practicable, since there are always small granules in process of development, which cannot readily be seen. The squeezing out of the follicles by means of the Knapp roller forceps, or some of its modifications, seems to be the most popular of the surgical methods in use at the present time. The principal objection to this method is that generally too great pressure is used, and injury done the healthy membrane, thus encouraging scar formation. Excision of the retrotarsal fold is entirely unnecessary and may be productive of much harm. Tarsectomy is extolled by some for that stage of trachoma where scar formation has begun, or even considerably advanced, and with more or less persistent pannus existing. Galvano-cautery is a dangerous procedure, being difficult of regulation, and promoting scar formation. Electrolysis has not been enthusiastically received. The use of the wire or bristle brush involves too much danger to the conjunctiva. Of all the methods which have come under my observation the one which has proven most efficacious and productive of the least injury, when properly done, is the sandpaper method of Coover. Number 0 or number 1 sandpaper is used, and it must be ascertained to be pure, since some contains an admixture of powdered glass. The paper is cut into strips ¾ inch wide by 3 or 4 inches long, and sterilized by dipping in alcohol and burning it off. Care must be used not to burn too long, since the sandy surface may be destroyed.

Is Trachoma Increasing in America?

Dr. Ernst Saxl did not think it necessary or advisable to prepare a formal paper, because the subject is a perfectly open question.

Is trachoma on the increase in America? My impression is that it is—I mean trachoma in contradistinction to the perfectly specific follicular conjunctivitis. I do not consider both as of the same type and character. Since our stringent immigration law, the people infected with trachoma are not admitted until they have been treated and cured of this infection. Some of them have gotten by the officials, by using adrenalin or similar products that relieved the swelling and redness of the lid, and the immigration authorities were deceived. I have been in charge of the eye clinic of the city, where quite a number of day laborers from the railroad camps and crowded boarding houses are seen. Recently there were considerably more trachoma cases than were in the habit of coming, so that we saw in the clinic ten cases in ten weeks, that many cases coming under the observation of one man.

If the health authorities have no control of the laboring camps and crowded boarding houses, I think trachoma is necessarily bound to spread. I had the opportunity of seeing two years ago, a case that came from Ilasco, and I found not less than twelve cases that had become trachomatous within twelve months. Ten of these cases disappeared; as to what became of them, whether they came into the hands of some competent man who took steps to cure them or whether they spread the disease into the country, I do not know.

In the last epidemic in Belgium 4,000 soldiers were infected, but I do not think we will ever have an epidemic of that kind again. It is our duty now to look out for these cases, so that there may be no danger of infecting others. I think when trachoma cases are seen they should be referred to the health department. The camps for infections diseases near the Female Hospital could be utilized to keep these patients under observation. In this way we could keep them from spreading the disease. I do not know that I can add anything except that I would like to ask some of those that have large clinics to give us information as to whether they see more trachoma cases than formerly. I wish to state that of the number admitted to the Missouri School for the Blind ten per cent are due to trachoma.

The School Board is a help in this direction. They will not permit a child with inflammation of the eyes to return to school without a certificate from a competent oculist. This, however, refers only to cases that have been sent home to their parents by the physician making the rounds of the school.

People should not allow a child to return to school until this necessary formality has been complied with. I think the United States Government is not strict enough; there are few places where a regular examination of the troops is made. Eternal watchfulness is the price that we pay for safety.

The only way we can handle this problem is (1) to keep track of all of our cases of trachoma. (2) That we try to get from every physician who has a chance to see eye diseases a report of the cases, and at the end of another five years see whether the number of cases has increased or decreased. (3) The state and city health departments' attention should be called to the existing conditions of this disease and its highly contagious character.

Discussion.—Dr. John Green, Jr.: I think that what Dr. Saxl has said is probably well founded. In Southern Illinois, Southern Missouri and Northern Arkansas trachoma is endemic.

Dr. Stucky, of Lexington, Kentucky, recently made a visit to the mountain regions of that State and found many of the poor whites infected; in some cases whole families had the disease, and their vision was impaired to such an extent that they could no longer read. And yet these people regarded this condition as "sore eyes" and of no seriousness.

During my term of service in the City Hospital two patients came under my observation that were blind from trachoma.

Recently I have been looking up the relation of immigration to trachoma. It appears that the immigration officials are thoroughly alive to the menace of this disease and have issued rigorous instructions to inspectors to exclude all immigrants with trachoma. At present I believe the Government regulations are sufficient to exclude all but a few immigrants with this disease. Some enter the country by way of Canada, where the officials are not so strict as in this country.

Dr. Jennings: It seems to me that from the increased number of physicians who are doing eye work all over the country, about 50 to 1, as compared with twenty years ago, that they ought to be able to treat a great many more cases and keep the disease under control. In Missouri, in the farming districts, many persons are suffering from trachoma. They are ignorant on sanitary matters, and all wash in the same bucket and all wipe on the same dirty towel. It seems to me we should take some steps to educate the people on these matters. Trachoma is not contagious in the degree that some other diseases are, and this spread can be prevented if people will only use sanitary precautions.

Dr. Gross: The question of the spread of trachoma has been studied by some men in Europe. In quite an extensive article in the *Zeitschrift fuer Augenheilkunde*, which appeared within the last two years, the author states that the number of trachoma cases has increased. He is thoroughly convinced that trachoma has spread very rapidly, and cases are becoming more numerous in Austria and that part of Europe. A large number of the cases we see here are among foreigners and people who come in contact with foreigners. In spite of the measures which the immigration officials take to keep them out, we see cases every day in the Washington University Clinic. Many of them do not know a word of English, and have managed to escape the vigilance of the officials. Under these circumstances I do not see how we can keep trachoma from spreading here with these foreigners coming in with fresh cases. Nor do I see how the Government can do anything in regard to taking care of those who have this disease. The Government finds it difficult to take care of such a disease as tuberculosis, which is a very serious economic problem. I do not see how anything can be done except to educate the laity, and that is rather difficult, because so many of these patients are foreigners and people of the lower classes come in contact with them.

Dr. Post: In my private practice trachoma cases are very rare; latterly I have seen very few. One interesting thing I have noticed in my connection of twenty years with the Blind School, is that there are children in the institution who have trachoma, and children who are blind whose conjunctivæ are normal; and in all these years I have not seen any children contracting trachoma from those who have it. Of course precautions are taken, but in an institution where the children are blind, it must be difficult to carry out these precautions. But the pupils do not seem to contract the disease and it has not spread in that institution.

The term "Blind Asylum" has been used; these are distinctly schools, not asylums. We used to have trouble in getting children into our Blind School, which was at one time designated as the Blind Asylum, and parents objected to sending their children to an asylum. We should do all we can to educate the laity as to the necessity of protecting their eyes against contagious diseases.

Among the educated classes this is pretty generally understood; we find almost all of them are awake to the danger of using the common towel or wash basin.

Trachoma is a danger to all of us. Some of the cases I have seen are among people who would consider that they had been very careful, and would be much surprised at the suggestion of any neglect of care on their part.

Dr. Parker—closing: In regard to the treatment with sand paper, I have seen a number of cases treated this way and there was no scar formation; and while I do not know that it will cure all cases, I will say that if properly done, we have less scar formation than by any other method I have ever seen employed. I have seen 130 cases treated this way, and so far the results are very satisfactory.

J. G. Calhoun,
Section Editor.

BOOK REVIEWS.

The Refraction of the Eye.

By GUSTAVUS HARTRIDGE, F. R. C. S., London, England. Fifteenth Edition. Published by P. Blakiston's Son and Company, Philadelphia.

The first edition of this Manual on Refraction appeared in 1884, and from that until the present year, 33,000 copies have been disposed of. This is a remarkable demand for any book on a special medical subject, and is due, in our opinion, to the fact that the author has produced by far the best work on refraction which has yet made its appearance. It is throughout a most reliable and satisfactory guide and teacher for practitioner or student. The author adheres to the teaching of refraction along safe and sound lines, and has kept his work free from unimportant matter, pictures, etc., having little to do with the principles and application of refraction, and representing mostly individual ideas and interests.

The present edition contains 275 pages and one hundred and ten illustrations, is logically arranged and takes the reader from the necessary optics, clearly and concisely explained in Chapter I, through every branch of the subject, in such a manner that with practice personally applied to individual patients, which of course the author insists upon, satisfactory results are obtained.

The illustrations are well selected and instructive, and answer the purpose for which illustrations are intended. Certain illustrations which appear in most books on refraction as a "matter of course" will not be found in the present work. For example, Mr. Hartridge does not think it necessary to devote pages to illustrating an ophthalmoscope, a trial case, etc., and has refrained from using the time-honored masterpiece showing two individuals comfortably seated, the one using an ophthalmoscope on the other. Such illustrations would doubtless have their use in a correspondence course and are becoming quite popular in the advertisements of the optometrist.

A short appendix includes an explanation of the linear

metric system with a table of equivalents in English inches, French inches, and centimeters. Also the regulations for the various English Government services, and a list of graded test types.
William T. Shoemaker.

Pathology and Bacteriology of the Eye.

By E. Treacher Collins, F. R. C. S., and M. Stephen Mayou, F. R. C. S., London, England. Published by P. Blakiston's Son and Company, Philadelphia. Price, $4.00.

This is the second volume of An International System of Ophthalmic Practice under the Editorship of Walter L. Pyle, A. M., M. D., Philadelphia. The names of the authors are a sufficient guarantee for an authoritative and up-to-date treatise on the pathology of the eye. Through years of devotion to the laboratory and exceptional opportunities for such work they are qualified as few are from their own studies and experience to produce a text book on this most important and fundamental part of ophthalmology.

In arrangement the authors have adopted a plan different from that of most text books upon diseases of the eye. Instead of treating separately of the affections met with in the various anatomical divisions of the eye, an inclusive description of diseases and pathological processes which occur in an organism or in one part of an organism such as an eye is given. Such description covers the life history of the organism and includes the process of evolution or development to a state of maturity; this state is reached and maintained by the absorption of nutrient material; there is likewise a capacity for resisting the pernicious influences of environment; and, finally, there comes a process of involution or degeneration.

Thus, Chapter I describes all developmental aberrations. Chapter II is devoted to neoplasms, for, as the authors say, tissues after having arrived at a state of maturity may reassume some of their embryonic characteristics. This is known as an atavism of tissue or teleplasia, the resulting formations being teleplasms.

Chapter III treats of the changes which result from derangements in the circulation of the various fluids through which the nutrition of the eye is maintained. Chapters IV, V and VI are devoted to disturbances resulting from pernicious influences in environment. These include injuries, which may be mechanical, chemical, thermal, electrical or radial; reaction of the tissues to irritations or inflammations, and also the parasites which invade the eye and the specific reactions caused by them. Chapter VII treats of degenerations.

This arrangement has worked out remarkably well; the necessity for repetition has been largely obviated, and reading as it were from cover to cover imparts a comprehensive knowledge of *pathology*, applied here of course to the eye, but likewise applicable to tissue wherever located. In this way the book is of great value; it broadens instead of narrows; it widens the horizon and tends to stimulate individual thinking.

An appendix contains the practical methods of obtaining and preparing material for examination, fixing, hardening, staining, etc., collecting blood, film making, preparation of vaccines, the Wassermann reaction, agglutination test, etc.

The book is well illustrated with three colored plates and two hundred and thirty-seven figures in the text, and mechanically conforms with the first volume of the System, upon Ophthalmic Therapeutics, which is all that could be desired.

William T. Shoemaker.

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